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**Report on the Technical Specification and Evaluation Criteria for
Phase 2**

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References and Applicable Documents

- PRACE-3IP deliverable, D8.1.1 “Technical Specifications for the PCP and for Phase 1”, December 2012
- [2] PRACE-3IP deliverable, D8.2.1 “Technical Framework for Evaluation of PCP Results”, September 2013
- [3] PRACE-3IP deliverable, D2.1.2 “First Report on the joint PCP Pilot (Phase I)”, November 2014
- [4] HORIZON 2020 WORK PROGRAMME 2014-2015 annexe G Technology readiness levels (TRL)
(http://ec.europa.eu/research/participants/data/ref/h2020/wp/2014_2015/annexes/h2020-wp1415-annex-g-trl_en.pdf)
- [5] US Department of Defense, “Technology Readiness Assessment (TRA) Guidance“, section 2.5, April 2011
(<http://www.acq.osd.mil/chieftechnologist/publications/docs/TRA2011.pdf>)
- [6] International Exascale Software Programm (IESP)
(<http://www.exascale.org/mediawiki/images/2/20/IESP-roadmap.pdf>)
- [7] European Exascale Software Initiative (<http://www.eesi-project.eu/pages/menu/publications/final-report-recommendationsroadmap.php>)
- [8] DARPA HPCS Programme
([http://www.darpa.mil/Our_Work/MTO/Programs/High_Productivity_Computing_Systems_\(HPCS\).aspx](http://www.darpa.mil/Our_Work/MTO/Programs/High_Productivity_Computing_Systems_(HPCS).aspx))
- [10] <http://www.green500.org>, November 2014
- [11] C. Bekas and A. Curioni, A new energy aware performance metric, Comput. Sci. Res. Dev. (2010) 25, pp. 187-195
- [12] <http://www.deep-project.eu>
- [13] <http://www.montblanc-project.eu>
- [14] Peter Kogge et al., ExaScale Computing Study: Technology Challenges in Achieving Exascale Systems, 2008, <http://www.cse.nd.edu/Reports/2008/TR-2008-13.pdf>
- [15] Rob Schreiber et al., Exascale Technology Roadmap Meeting. Node Architecture and Power Group, 2009
- [15] PRACE-PP Project, D7.6.1 Procurement Strategy
- [16] PRACE-1IP Project, D2.2.4 PRACE Operational and Procurement Model
- [17] PRACE-1IP Project, D9.3.3 Report on Prototypes Evaluation
- [18] PRACE-PP Project, D5.4 Report on the Application Benchmarking Results of Prototype Systems
- [19] Commission of the European Communities, “re-commercial Procurement: Driving innovation to ensure sustainable high quality public services in Europe”, COM(2007) 799 final (http://ec.europa.eu/invest-in-research/pdf/download_en/com_2007_799.pdf)
- [20] PRACE-3IP PCP, “Tender Regulation for the award of a Pre-Commercial Procurement contract concerning R&D services on ‘Whole System Design for Energy Efficient HPC’”, 20 November 2013
- [21] PRACE-3IP PCP, “Technical Requirements”, 20 November 2013

List of Acronyms and Abbreviations

AC	Assessment Committee
CINECA	Consorzio Interuniversitario, the largest Italian computing centre (Italy)
CSC	Finnish IT Centre for Science (Finland)
DoW	Description of Work
EC	European Commission
EPCC	Edinburgh Parallel Computing Centre (represented in PRACE by EPSRC, United Kingdom)
EU	European Union
FP7	7 th Framework Program
FTE	Full-time equivalent
FA	Framework Agreement
FZJ	Forschungszentrum Jülich (Germany)
GENCI	Grand Equipement National de Calcul Intensif (France)
GoP	Group of Procurers; a subset of PRACE-3IP partners committed to the PCP
HPC	High Performance Computing; Computing at a high performance level at any given time; often-used synonym with Supercomputing
HPL	High Performance Linpack benchmark
IP	Intellectual Property
IPR	Intellectual Property Rights
JSC	Jülich Supercomputing Centre (FZJ, Germany)
MoU	Memorandum of Understanding.
NDA	Non-Disclosure Agreement. It is typically signed between vendors and customers working together on products prior to their general availability or announcement
NRE	Non-Recurring Engineering
PCP	Pre-Commercial Procurement
PE	Procuring Entity
PRACE	Partnership for Advanced Computing in Europe
PRACE aisbl	PRACE Association Internationale Sans But Lucrative
PRACE-3IP	PRACE 3 rd Implementation Phase project
R&D	Research and Development
RUP	Responsabile Unico del Procedimento
SME	Small and Medium Enterprise
TED	Tenders Electronic Daily (online version of the 'Supplement to the Official Journal of the European Union', dedicated to European public procurement)
Tier-0	Denotes the apex of a conceptual pyramid of HPC systems. In this context the Supercomputing Research Infrastructure would host the Tier-0 systems; national or topical HPC centres would constitute Tier-1
TRL	Technology Readiness Level
USA	United States of America
WP	Work Package

Executive Summary

This deliverable reports the further progress on the PRACE-3IP Pre-Commercial Procurement (PCP) including the preparation of the tender documents. The PCP entered Phase I¹ of the execution state on September 9, 2014. This first phase will end 6 months later, i.e. on March 9, 2015. Shortly before the end of Phase I we plan the publication of the tender for Phase II, which will start in May 2015. All four Contractors in Phase I will be invited to submit a bid for Phase II. Based on the evaluation of these bids we anticipate awarding three of the Phase I contractors with a contract to provide further R&D services within this PCP.

1 Introduction

In this document we describe the preparation of the tender for Phase II focussing on the evaluation criteria. We will start in section 2 providing necessary background information on this PCP, its organisation and the relevant rules which had been layed-out, in particular in the Tender Regulations, and how the evaluation process will be organised. The main part of this deliverable, sections 3 and 4, provides a rationale for the technical documentation, which the bidders have to provide, and the evaluation criteria. Both are defined in the current draft for the tender for Phase II, which we added in the Appendix.

2 Implementation of the PRACE-3IP PCP

2.1 Background on the PRACE-3IP PCP

Within the PRACE-3IP project an international consortium of six partners has been setup to form a Group of Procurers (GoP) for procuring R&D services through means of a Pre-Commercial Procurement. It is the first time that this instrument is used for promoting innovation in the field of high-performance computing (HPC). The budget available to contractors within this PCP is €9 million.

The GoP currently comprises the following members:

- CINECA (Italy)
- CSC (Finland)
- EPCC (UK)
- FZJ (Germany)
- GENCI (France)
- PRACE aisbl as observer

The GoP nominated CINECA as the Procuring Entity with the responsibility to carry out the entire procurement in the name and on behalf of the members of the GoP.

Through this PCP, PRACE-3IP targets one of the main obstacles for further increase of performance of high-end HPC systems towards the Exaflop/s range, namely energy efficiency. Given that the available budget is small compared to the costs of developing a next generation of high-end HPC systems, this PCP expects contractors to target their R&D efforts on specific components such that maximum impact on improving energy efficiency of the whole system is achieved. This improvement must be demonstrated by delivering pilot

¹ In this deliverable we use the notation “Phase I”, “Phase II”, ... instead of “Phase 1”, “Phase 2”, ... to be consistent with the tender documents.

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systems in Phase III of this PCP. A pilot system is a fully functional HPC system, which will be operated in a production-like environment at the site of any of the GoP members. The PCP hence aims on “Whole System Design for Energy Efficient HPC”.

One of the key technical goals, which have been formulated for this PCP, is to make those future HPC architectures becoming more energy efficient, which are suitable for becoming part of a future PRACE infrastructure. These architectures thus must support a broad range of applications. This PCP does, however, not cover the full design of pre-exascale or exascale architectures, as this involves significantly higher development costs.

A PCP is organised as a competitive process for which three phases are foreseen as required in the PCP process specified in [19]. In this PCP we aimed for 5, 3, and 2 contractors to compete Phase I, II, and III, respectively. Within the different phases of the PCP the work is expected to be organised as follows:

- Phase I (solution exploration): During this phase contractors are expected to work on a design specification for the new technologies and solutions to be developed within the PCP, a high-level design specification for the final system architecture solution, an application porting strategy, and an energy efficiency analysis.
- Phase II (prototyping): In this follow-up phase contractors will start to work on lab prototypes, write a detailed specification of the overall architecture as well as the pilot system, and work on performance and energy consumption models.
- Phase III (original development of a limited number of first products/services): The final phase focusses on implementing first versions of the final architecture and their deployment as pilot systems. These pilot systems will allow to verify the technology readiness and to proof the progress in terms of energy efficiency.

The following contractors started their work in Phase I on September 9, 2014:

- Bull SPA (France)
- E4 Computer Engineering Spa (Italy)
- Maxeler Technologies Limited (UK)
- MEGWARE Computer Vertrieb und Service GmbH (Germany)

A fifth bidder was invited to become a contractor, but did not sign for internal reasons.

2.2 Tender Regulations

All relevant procedural aspects of the PCP are governed by the Tender Regulation [20]. It describes the transition from Phase I to II and lays out rules for defining the criteria for evaluating the bids for Phase II.

Clause 2.4.2 of the Tender Regulation [20] states that the call for tenders to perform services within the scope of Phase II will be published one month prior to the completion date of Phase I.² The contractors of Phase I are invited to submit a bid within one month plus three weeks. The criteria used for evaluating the bids and awarding contracts for Phase II are to be set forth in this call. The evaluation of the bids must be performed after assessing the performance of the contractors of Phase I based on their deliverables. While assessment of these deliverables and evaluation of the bids are strictly separated, the contractors are expected in Phase II to build on the solutions designed in Phase I.

² Due to a delay in preparation of the tender for Phase II the publication will be delayed with respect to end of Phase I. The start of Phase II will be shifted in order to keep the distance between time of publication of tender for Phase II and start of Phase II, respectively, as defined in the Tender Regulations.

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In clause 3.6.3 of the Tender Regulation [20] we defined a set of evaluation criteria including weight factors, which both will remain the same throughout all phases of the PCP. In this way the bidders are provided with a certain amount of consistency during this multi-phase process, while it leaves the GoP the opportunity to steer the PCP by defining specific evaluation subcriteria for each phase.

The overall technical criteria and their weights as defined in the Tender Regulation [20] are the following:

	Criteria	Description	Weight
I	Quality of R&D and level of innovation	Quality of the offered R&D services and the solution's ability to innovate and improve substantially the scope of operation in which it is intended to be inserted.	30%
II	Technical requirements compliance	Level of compliance of the solution (in terms of quality and completeness) to the functional and performance requirements.	20%
III	Progress in terms of energy efficiency	Solution's ability to progress energy efficiency beyond state-of-the-art.	30%
IV	Project quality and feasibility	Quality of the project (work planning, risk management etc.) as well as feasibility and reproducibility of the solution using an industrial process proper respect to the reference market.	20%

Clause 3.6.3 furthermore defines the overall weight of the technical criteria to be 90. After having performed the technical evaluation, an evaluation of the financial offer will be performed with a maximum score of 10. The bids will be ranked according to the sum of the score obtained from the technical evaluation and the evaluation of the financial offer.

2.3 Organisation of the evaluation process

The evaluation of the bids for Phase II will be performed by the Assessment Committee (AC), a panel of experts, nominated by the GoP Committee and appointed by the Procuring Entity.

The Assessment Committee, in accordance to Italian regulation, is chaired by the Deputy Coordinator (appointed by CINECA as the Procuring Entity) and co-chaired by the Coordinator. In addition, it includes one person and a substitute per GoP member (none of them can be a delegate to the GoP committee) and one representative of the Procuring Entity's administrative department. The chair of the assessment committee is the unique reference for the procurement procedure (Responsabile Unico del Procedimento). Additionally, PRACE AISBL is entitled to attend AC meetings with a consultative voice only, and without voting powers.

The appointment of the AC must only take place after the reception of all tenders. However, as legal and technical expertise might already be required before that time in order to answer questions from the contractors, the GoP will ensure that suitable experts are available.

Exactly the same organisational approach was chosen for evaluating the initial bids for this PCP. As reported in deliverable D8.2.1 [2] this approach has been proven as capable of producing a satisfactory result.

3 Technical Documentation

As part of their bid the contractors have to provide technical documentation, which should contain all information that is needed to apply the technical evaluation criteria. More specifically, the contractors are requested to submit the following documents:

Technology design specifications (TD-2-01): Through this document suppliers are requested to provide in-depth information on the innovative technologies which enter the solutions they are developing in the framework of this PCP.

High-level architecture and pilot system design specification (TD-2-02): This document is expected to contain an outline of the architecture of the pre-exascale system in which the new solutions for improving energy efficiency of the whole system will be integrated. More details should be provided about the planned pilot system.

Definition of targets for execution time and energy consumption (TD-2-03): To fix the targets to be achieved for the provided benchmark applications in terms of time-to-solution and energy-to-solution the suppliers must, at this point in time, provide an analysis of how they expect all the benchmark applications to perform in these terms on their planned solutions. The targets must be defined with respect to the “large input deck”³, smaller input decks had been provided for testing purposes and convenience only. This analysis should be sufficiently detailed to allow for an independent assessment of the accuracy of the estimates made and should include explicit values (in SI-units, e.g. Joules and Seconds) for what the suppliers consider to be achievable performance targets for the benchmark codes on the pilot systems they intend to deliver as part of the PCP.

Detailed work plan for phase II and III (TD-2-04): The work plan should be sufficiently detailed to allow for an assessment of the quality of the work organisation and thus create confidence in the targets being attainable.

Business plan for the pilot system (TD-2-05): Building and deploying a pilot system with a floating-point peak performance of 1 PFlop/s is a challenge in terms of costs. Therefore the bidders are requested to perform an analysis of the costs at a sufficient early stage of the project.

Risk analysis for reaching targets at the end of Phase III (TD-2-06): To further improve confidence in the ambitious targets to be reached at the end of Phase III the suppliers are requested to provide a risk analysis. This analysis should allow an assessment whether the supplier has a good understanding of all major risks involved in his approach and is able to provide mitigation strategies.

Market analysis from 2017 onwards (TD-2-07): The PCP should enable R&D which leads to solutions that are likely to meet the needs of a sustainable market, which should include markets beyond HPC. After completing the solution space exploration during Phase I the suppliers are asked to update their market analysis, where new developments and improved understanding of the market conditions as of 2017 should be taken into account.

Human resources and place of performance documentation (TD-2-08): This PCP mandates that 80% of the R&D services are performed in Europe. By providing this documentation it will be possible to evaluate whether the bidder meets this minimum requirement.⁴

³ See: PRACE-3IP PCP Pre-Commercial Procurement concerning R&D services on “Whole System Design for Energy Efficient HPC”: Benchmark Documentation.

⁴ During Phase I 100% of the R&D was done in Europe.

4 Evaluation Criteria for Phase II

In this section we discuss the evaluation criteria which are defined in clause 3.5.2 of the tender for Phase II (see Appendix).

4.1 Quality of R&D and level of innovation

During Phase I, contractors will have explored the solution space and should thus be in the position of providing detailed technical specifications of the solutions that they plan to integrate in future HPC architectures. The level of detail is a good metric for the quality of R&D at this point of time.

A PCP aims for technology which is new, i.e. one where the technology readiness level (TRL)⁵ cannot be too high. Still, the technology could become available as a product, or part of a product, soon after the PCP ends. Therefore the technology must not be in a conceptual state anymore, when starting with Phase II, i.e. the TRL cannot be smaller than 3. During this phase the technology is expected to be tested using laboratory prototypes, which would correspond to a TRL of 4. The criteria is therefor formulated such that a TRL equal or larger than 3 is expected, but for higher TRL a smaller score will be assigned.

The technology developed in this PCP must be innovative and thus constitute progress beyond state-of-the-art. Progress will be assessed in comparison to solutions and products available today and progress may be achieved by integrating recently developed technology in future solutions. This also includes the case, where existing solutions are adapted for use in HPC, resulting in a significant improvement of energy efficiency. Ideally, the result can be considered as a break-through, and thus for this case highest score is foreseen.⁶ This assessment of progress beyond state-of-the-art will be performed for each of the bids irrespective of the other bids to avoid relative evaluation.

We consider the quality of R&D metric and progress beyond state-of-the-art as the more important criteria and thus foresee a slightly higher weight for these. For the transition from Phase II to III we expect technology readiness to become a more important criterion, which will thus receive a higher weight.

4.2 Technical requirements compliance

The outcome of the PCP should result in a whole system design where new technologies developed within this PCP are integrated. The next set of criteria allow to evaluate the quality of the provided documentation concerning overall system design, its performance target and, most importantly, compliance with the technical requirements formulated in the original tender (Technical Requirements document [21]).

The first criterion concerns the comprehensiveness of the specification of the final pre-exascale architecture (TD-2-01 tender for Phase II Appendix), which can still be high-level at this point of time, as well as the pilot system design specification. The latter should have reached a high level of detail to demonstrate readiness for prototypical implementation work during Phase II.

In order to assess compliance with the technical requirements, a good level of detail in the description of all sub-components is expected (TD-2-02 tender for Phase II Appendix), which is assessed with the next criterion. The energy measurement capabilities are of particular

⁵ See [4] and [5].

⁶ We expect most suppliers go for an evolutionary approach.

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interest, as this is component feature required for verifying the progress obtained in terms of energy efficiency. This will enable us to perform direct comparisons for the same applications and input decks between the pilot systems deployed in Phase III in terms of energy efficiency.

Energy efficiency measured according to an energy-to-solution metric could be improved by reducing clock speed. To avoid compromising on time-to-solution, the technical requirements defined for this PCP mandate that time-to-solution is not reduced. Suitable reference numbers had been provided to all contractors of Phase I for all application benchmarks. At this point in the process, measurements of time-to-solution on the final architecture will not be possible and thus contractors are expected to perform extrapolations. The criterion concerning time-to-solution targets also involves an assessment of the ability of the supplier to meet the technical requirement as well as the quality of his analysis. The latter is to avoid suppliers to set optimistic performance targets which are not likely to be reached. The quality of the analysis will be assessed by checking for completeness of the analysis in different aspects as well as for documentation of assumptions and risks.

4.3 Progress in terms of energy efficiency

For Phase II the bidders are expected to become more specific on how much gain in energy efficiency can be realised through the solutions which they propose. For this end they will have to define targets for energy-to-solution for all of the provided application benchmarks. To avoid assigning a high score to those bidders which are more optimistic than others about the feasibility of their targets, the quality of the energy efficiency analysis for the given benchmarks is taken into account. This involves an evaluation of the level of detail of the provided analysis as well as the documentation of assumptions and risks. Furthermore, the evaluation will consider whether the virtual data centre model was applied to assess the overall power consumption. No assumptions are made about the progress on porting the provided application benchmarks to the proposed solution. This prevents discrimination against bidders that propose more radical architectural changes and where porting efforts will require more efforts, as these are provided with the possibility of explaining the opportunities of the proposed solution.

For the transition from Phase II to III the project will consider to limit the set of application benchmarks for which reduction of energy-to-solution is actually demonstrated. To remain consistent with the original tender documents and the technical goals⁷ defined therein, the bidders will continue to be requested demonstrating that these applications can be ported to their solutions.

4.4 Project quality and feasibility

The final set of evaluation criteria is related to the quality of project organisation, which is important to assess whether it will be feasible to reach the targets through the foreseen R&D services. Different criteria are foreseen for evaluating the following technical documents:

- Work plan (TD-2-04 Tender for Phase II in Appendix): This should provide a sufficient level of detail to demonstrate good understanding of the required R&D steps and provide an overview on the foreseen resources.
- Business plan (TD-2-05 Tender for Phase II in Appendix): As deployment of a pilot system is a key step in Phase III of the PCP with significant costs involved, an

⁷ Technical goal TG-4-4 reads: “All applications must be demonstrated on the final pilot systems executing to completion in equal or less wall-clock time than the original measurements performed by PRACE.”

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incentive must be given to the bidders to provide a detailed cost analysis already at this stage of the project by earning scores for providing a detailed business plan.

- Risk analysis (TD-2-06 Tender for Phase II in Appendix): Any ambitious R&D project involves significant risks, which are typically larger when less conventional solutions are explored. The criterion is formulated such that bidders are not penalized for approaches which involve higher risks, but rather check for risk analysis being comprehensive with suitable mitigation strategies being defined.

The last criterion will be used for evaluating the provided market analysis document (TD-2-07 Tender for Phase II in Appendix). Higher credits should be given for comprehensive analysis of the market opportunities which arise because of the new solutions developed within the PCP. This document should not just comprise of a general analysis of how the HPC market evolves.

For the success of the PCP the work plan, business plan and risk analysis are more important and thus a slightly higher weight is given to these criteria.

4.5 Financial criterion

The financial offer is evaluated following a very similar approach as for Phase I. The Tender Regulation (clause 3.6.3) [20] sets the maximum score of the financial offer to 10. This reflects our opinion that the technical quality of the offer should have more weight than the financial aspects. The score is again assigned using a formula which linearly interpolates between a floor price and a maximum price. Zero point is assigned if maximum price is requested, while the maximum score is assigned if the price is equal or lower than the floor price. The maximum price is fixed through the budget. The floor price is based on the estimate that personal resources of least 3 FTE over 10 months are needed plus NRE costs of at least €50,000 for prototype development. We assume personal costs per month including overhead to be €12,500.

5 Conclusions

In this document we reported on our work on preparing the transition from Phase I to Phase II of the PRACE-3IP PCP. We provided an overview of this PCP, including its goals, organisation and timeline. A more detailed description recalled the rules for this transition as it has been presented in the original tender documents.

We provided a detailed rationale for all the technical documents, which the contractors of Phase I are expected to attach to their bids for Phase II, and for all evaluation criteria including the foreseen weights per criterion.

The criteria are formulated such that an absolute evaluation is performed, in contrast to a relative evaluation of different bids. The foreseen criteria will allow for a fair and individual assessment of each bid and take the experience made while evaluating the initial bids for the Framework Agreement into account.

6 Appendix: Phase II Tender Document

See attached document “PRACE-3IP PCP Tender Phase II”.