Application Guidance for embedded CSE

<Updated on 5th June 2018>

Please follow this guidance to help prepare your application for an eCSE call. Applicants should submit their applications on-line using the eCSE Funding Calls section within the SAFE <https://www.archer.ac.uk/safe>. If you are not a registered SAFE user, please register first. Each call has its own proposal form and applicants must use the form associated with the relevant call. Proposals will not be accepted if an incorrect form is used.

Please also read the online call information:

https://www.archer.ac.uk/community/eCSE/calls.php

I. Online submission for eCSE application

i. The Mandatory Information

Applicants should provide all the mandatory information requested in the online eCSE application form. The panel reserves the right to reject applications with missing information.

- Project Details

Please provide the following required information for your proposed project:

- Is this proposal a re-submission?

Please identify whether this is a resubmission of a proposal. Please provide further information for this re-submission in the proposal template section 12.

- Is this a follow-on proposal?

Please identify this proposal as a follow-on proposal if the PI and/or Co-I(s) are involved in any current eCSE projects or projects previously funded by the eCSE programme. Please provide further information for this follow-on proposal in the proposal template section 13.

- Is this a New Communities proposal?

Please identify if this is a proposal from a new community. Please see more details about New Communities in the following section "ii Project Proposal – 2 New Communities Justification". If you consider your proposal is from a New Community, please provide further information for the New Community justification in the proposal template section 2.

- Applicant Details

Please enter the details of the PI for the eCSE project. In line with EPSRC eligibility criteria, PIs must be employees of an eligible organisation and must be resident in

the UK. A description of eligible institutions is given here:

http://www.epsrc.ac.uk/funding/howtoapply/fundingguide/eligibility/organisations/

- Proposed Technical Staff Details

Please provide details of all the proposed technical staff. If the proposal requires support / technical contribution from the ARCHER CSE team, we encourage you to contact the ARCHER helpdesk: support@archer.ac.uk before your proposal submission. In the case that the proposed technical staff cannot be confirmed before the application submission, please list the appropriate skills required for the candidate(s) to carry out the proposed project.

For each of the proposed technical staff, please provide a number for the technical effort level in person months (PMs), e.g. 6 PMs. In the case where the project includes some effort to be undertaken by the ARCHER CSE team, please include an entry for this effort. If the specific CSE staff member has not been identified by the time of the submission please just enter "ARCHER CSE team" as the Name, Department, etc. but please ensure the amount of effort is noted here.

Please note that the ARCHER CSE contract is presently due to finish on the 17th November 2019. This means that:

- The maximum number of staff project months that may be requested per project is 12 months, this is inclusive all the technical staff.
- All projects must be completed by the 17th November 2019, the current date for the end of the ARCHER service.
- All successful projects will be expected to produce a final report. These must be received within 6 weeks after the project end date and no later than 31st December 2019. Please note that the ARCHER service is currently due to be decommissioned on the 17th November 2019 and projects may not have access to the service after this date.
- Successful projects may start on or after the 1st October 2018, subject to contract and/or agreement.

Please provide the total 100% Full Economic Costing (FEC) for each named member of technical staff in the proposal. This includes direct and indirect costs. However, this does not include costs for the PI/Co-Is or for additional costs such as travel given separately in the travel section which will be considered separately by the panel. We would advise you to carry out a costing within your university using the same process you would use for an EPSRC/NERC research grant and provide us with this costing. Most institutions can provide a breakdown of costs using pFACT or equivalent and if you have this then please attach it to your submission otherwise please send this breakdown to us as soon as you can after submission. Please note, for successful applications, the fee payable to individual researchers in the project team is 80% of FEC. We strongly advise you to identify staff before the proposal is submitted where possible. The only exception here is if ARCHER CSE staff are being requested although where possible you should contact EPCC in advance about this. If the organisation carrying out the technical work does not use FEC or if

you have any queries or require assistance regarding the costs, please contact the ARCHER helpdesk: support@archer.ac.uk. Note that costings are not required if EPCC will be providing the technical work for your project. In this case simply tick "ARCHER Staff member" when completing the fields within the technical staff section. The proposed start date and number of person months for each staff member should be given all in cases.

Please provide details of any existing funding for the proposed technical staff, e.g. for a postdoctoral researcher, please list the funding organisation, funding length, start- and end-date, etc.

- Resource Required

ARCHER computing resources will be made available at a level of 100 kAUs on the current ARCHER system per staff month awarded. In the rare case that extra computing resources are required to carry out the proposed project, please provide an estimate of the amount of extra AUs required together with justification for this. The extra computing resources will be provided subject to approval by the panel only.

- Time awarded on the KNL for successful proposals

As with all eCSE proposals, all successful projects will be awarded a small AU budget to complete the proposed work. This will be commensurate with the level of AUs funded for projects on the ARCHER Cray XC30. Please note there are other mechanisms to gain larger amounts of AUs.

- Travel

The eCSE programme only funds travel for the proposed technical staff to either meet with colleagues on the same project, e.g. PIs and Co-Is, or for specific training courses. Note the eCSE programme does not fund travel to conferences or workshops, nor does it fund travel outside the UK. As a guide, we would expect 2 to 3 single day visits for a technical member of staff with 12 PMs of effort. Travel costs will be funded **only** for the technical staff working on the project and **not** for PIs/Co-Is, etc. Please briefly list the travel plan, e.g. travel purpose, destination, etc. with a breakdown of the costs. An estimate of the overall travel cost should be provided as well. In the case where there is more than one proposed member of technical staff please further breakdown the cost per person.

ii. Project Proposal

Applicants should complete their eCSE project proposal using the provided proposal template <http://www.archer.ac.uk/community/eCSE/eCSE_ProposalTemplate.doc>. Please upload the proposal (word file or PDF file) when filling in the eCSE application on SAFE <https://www.archer.ac.uk/safe>.

All files must be submitted in PDF format: Please note we need to be able to combine documents sent to us into one file during the reviewing process and if your proposal is successful we may need to extract the work plan for contract and

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schedule documents. Please ensure that all documents are submitted as PDFs and that any PDF documents uploaded are not locked in such a way that prohibits either copying information from them or combining them into larger documents.

The project proposal for eCSE calls should consist of the following 14 sections. The guidance for the limits for each section is given below. For the purpose of this call, ARCHER includes the existing ARCHER systems - the Cray XC30 and XC40 Xeon Phi systems – and the term ARCHER 2 includes any potential UK National HPC replacement to the ARCHER service.

1. Project Title

Please fill in the project title in the proposal. The title should be the same as that which was provided in the SAFE online submission form.

2. New Communities justification (max. 0.5 page / approx. 350 words)

If you are applying as a New Community please briefly describe the scientific area which will benefit from the developments in this project and describe why this is a new scientific area to ARCHER / ARCHER 2. This information will be used to assess whether your project is from a New Community or not.

New scientific communities are communities from scientific areas not currently exploiting the ARCHER system. These communities are likely to have a scientific need for ARCHER / ARCHER 2 and a need for greater computational power than available at a regional level. Examples include:

- A science community not currently exploiting the ARCHER service, that wishes to develop a code to be able to exploit ARCHER and ARCHER 2 to do new science;
- A science community currently exploiting a regional service, but not ARCHER and that requires greater computational power.
- A science community that wishes to exploit existing algorithms or code on ARCHER to carry out significantly different science from that currently being carried out on ARCHER;
- A science community wishing to add additional functionality to an existing ARCHER code, to carry out significantly different science from that currently being carried out on ARCHER.

This does not include a science community wishing to extend an existing ARCHER code for only moderate diversification of the scientific area.

If you are a new user to ARCHER but from an existing scientific area, you are still welcome to apply for an existing community eCSE. However, we would encourage you to contact the relevant ARCHER consortium first. Details of ARCHER consortia can be found on the ARCHER website <http://www.archer.ac.uk/community/consortia/>.

3. Project Objectives and success metrics (max. 1 page / 4-5 objectives)

Please state the intended objectives of your project, in order of priority. In addition to

forming part of the proposal assessment criteria, should your proposal be accepted you will be asked to report against these objectives. These will be used to assess the final success of your project and will also be taken into account when assessing your proposal.

Examples include but are not limited to:
- The enablement of the scientific community to perform novel and previously untenable simulations;
- A quantifiable improvement in performance or scaling of a code;
- The integration of new algorithms/functionality into a code;
- Measurable outcomes leading to wider accessibility in the user community;
- Project outcomes of specific importance to the ARCHER community.
- Preparing codes for future UK Tier-1 systems, including improving maintainability and sustainability.

For each objective, applicants should provide an associated set of success metrics, metrics that are specific and measurable and can be used to assess whether the objective has been met at the end of the project.

Applicants are encouraged to list their objectives and success metrics, for example as a table or bulleted list.

4.   Project Overview (max. 1 page)

This section should give a general description of the proposed project. A brief summary of the project impact is also to be included to indicate who might benefit from the proposed project and how they will benefit from it.

5.   Applicants' Track Record (max. 1 page)

This section is to demonstrate that the proposed team members (main proposer, co-proposer(s), and proposed technical staff, etc.) have the appropriate skills, expertise and experience to carry out a successful project. This section should describe the track records of the proposed team members who will carry out the work. This section should concentrate on the skills of HPC, software engineering and management, rather than be based only on the general scientific background of the team. In particular, you may want to introduce:
- A summary of the outcomes from the proposed team members' recent work in related HPC projects/research.
- The specific expertise available from the team members who will carry out the work
- Previous relevant work / collaborations with other beneficiaries.

Please enclose a CV for each of the proposed technical staff as a supporting document.)

New Communities: Applications from New Communities are not expected to have significant experience of utilising ARCHER so should provide a suitable training plan. New Communities should consider if the project requires additional effort from the centralised CSE team and are encouraged to discuss this with the CSE team

support@archer.ac.uk in advance of submitting a proposal.

6. Technical Information (max. 3 pages including figures)

This section should provide the technical background for the proposed project and demonstrate a good knowledge and understanding of previous and current work in the related area. The technical information provided may include but is not limited to:

- A brief summary of the previous / current use of the code by the applicants and others, including the HPC platforms used, the software environments for the code running, the number of cores and problem size used, etc.
- The previous / current code performance, scaling and profiling.
- The major algorithms and functional updates related to the code to be used in the proposed project.
- The important prerequisites for the proposed project, e.g. the key algorithms, libraries, software to be installed, etc.
- If there are multiple codes available which have similar functionality to the code you are proposing to work on, please justify your choice of code.

High-resolution images / figures can be uploaded as supporting documents.

New Communities: Applications from New Communities are not expected to provide performance and scaling data from the ARCHER service. However, data from previous HPC platforms should be provided to help the panel make an assessment of the proposal.

7. Computational Benefits and Scientific Benefits (max. 1 page)

Applicants should identify and describe the computational and scientific benefits considering the following aspects:

- Why the proposed project is needed and what outcomes/benefits are to be expected.
- Who will be the beneficiaries for this proposed project (the applicants' own research, other research groups, science/computational communities, other disciplines, etc.) and how will the achievement impact the beneficiaries. In cases where only a limited number of immediate users will be impacted by the project outcomes, there should be a clear demonstration of the future applicability of the project's achievements (e.g. developing a code to replace a current one, enhancing future capability, attracting a new user group to ARCHER)
- Plans for sharing the project outcomes and experience within scientific / computational communities should be included in this section. Where there is a clearly identifiable central source for a code, applicants are required to provide assurance that their proposed code modifications will become incorporated. In such cases a letter of support from the code owners outlining the intent to include and publicise any or all proposed code modifications in the main source should be uploaded as a supporting document.
- Any scientific advancements which will be facilitated/enabled by the completion of the proposed project are expected to be included in this section. Supporting letters from UK research groups which give details of the scientific

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justification are also encouraged to be uploaded as supporting documents.

8.   Benefits for the ARCHER Community (max. 1 page)

The section should explain how the outcome(s) of the proposed project will benefit the user community of ARCHER including any anticipated user community on any future UK HPC Tier-1 system. This explanation should include details of the size and nature of the community that will benefit. Please provide details of how the code will be made accessible to this community, including any licensing restrictions.

As part of the justification for use on any future UK HPC Tier-1 system, we would anticipate a commitment to show the effective use of the code(s) on the existing ARCHER service (e.g. through performance/scaling data on ARCHER).

New Communities: It is recognised that for New Communities the benefits to ARCHER may be part of a longer-term, multi-stage process. You should describe the long term goals for the benefits to the ARCHER community (and to the future Tier-1 community) as well as specifying any benefits which will be realised at the end of this eCSE project. It is also recognised that New Community applications are unlikely to have existing ARCHER users who will be able to access the outputs from this project immediately. In these cases you should describe how you plan to generate these users, e.g. through community building exercises or applying for computing time.

9.   Sustainability / Pathways to Impact (max. 1 page)

This section should describe the activities which will help to achieve the impact as outlined in the Project Overview, i.e. what will be done to ensure the potential benefits are achieved. Examples of what to include here are:
  • A list of intended impact activities to be done and ways to implement them.
  • A plan of deliverables and milestones for the impact activities.
  • Any required resource for the impact activities.

Please provide details of how the code and the specific outcomes of this work will be sustained beyond the project. This should include details of the code(s) availability and licensing.

10.   Embedded CSE Support Requested / Work Plan (max. 2 pages)

This section should explain the work plan of the proposed project, including the implementation plan of the technical work within the given time schedule, the specific milestones to be completed and the personnel efforts required from the eCSE (in personal months). If any personnel will work on the project for less than 100% of their time, e.g. if a member of staff is part time or working on the project in conjunction with other work, this should clearly be stated. Graphical representations are encouraged.

The technical work plan should be described in detail, which may include the code(s) to   be   used,   the   approach   for   implementation,   the   expected   code

scaling/performance after the technical work is completed, etc. Any potential risks should be identified and stated clearly together with their likelihood of occurring and any possible solutions.

If there are any individuals / research groups / collaborations suggested by the applicants to contribute to this proposed project, please name them and upload a brief CV of their relevant expertise as a supporting document. Alternatively please list the necessary knowledge and skills they will provide for the proposed work to be carried out.

New Communities: New Communities are particularly encouraged to include an integrated training plan. We also encourage these groups to request additional efforts from the CSE team, where appropriate, to support the technical members of staff of the project.

11. Please list any consortia involved in work related to the proposed eCSE project.

Please identify the name of a consortium if:
• The proposed eCSE project enables science within the scientific remit of a consortium on ARCHER
• The outcomes of the proposed eCSE project may benefit that consortium.

12. If this proposal is a resubmission of a previously unsuccessful proposal/proposals, please list the eCSE ID(S), the title of the previous proposal(s) and include the name of the PI and Co-Is.
•   Please explain within your proposal what you have done to address any points raised by the panel following your previous submission.

13. Please list any current eCSE projects, or projects previously funded by the eCSE programme, for every PI and Co-I. Include the eCSE ID, the name of the PI, Co-Is and the project title.

14. If you listed any current or previously funded eCSE projects in section 13 please upload a copy of the corresponding final report. If the final report is not yet complete, please explain why this is and complete the given sections below which will appear in the corresponding report.
•   If this is a proposal for a project which follows on from another funded eCSE project it is important that the Panel have as much information about the outputs of the previous projects as possible. For this reason we ask that you include the corresponding final report as a supporting file. If the final report is not yet complete, please explain why (e.g. the project recently finished and the final report is not yet due) and include the sections "1.1 Achievement of objectives", "1.3 Summary of the software" and "3.1 Workpackage summary" that will appear when the final report is submitted.
•   If this project follows on from multiple projects then please repeat for all relevant projects

iii.   Supporting Documents

Please upload any extra supporting documents when filling in the eCSE application on SAFE <https://www.archer.ac.uk/safe>. The supporting documents may include CVs of the proposed technical staff, letters of support stating why the work will be of benefit or how/why the users may make use of the proposed code improvements, breakdown of staff costings, bigger version / high-resolution images/ figures, etc. Please note the supporting documents should not be used to include further technical information or additional text for your uploaded proposal. The file type of the supporting documents can be any of the following: .doc files, .docx,. docx files, .pdf files, .jpg files and .png files. Please refer to the note about uploading PDF files in ii Project Proposal.

II.   Evaluation Process and Notification of Decisions

Applicants will receive an acknowledgement of submission when a proposal has been received by the ARCHER CSE team.

Each eCSE application will be assessed in two stages: the Technical Evaluation and the eCSE Panel Review. The total assessment process will take approximately 8 weeks after the eCSE call closed. Separate feedback will be sent to applicants based on the two review stages.

The application will be reviewed by the technical reviewers first, to make sure that the proposal is technically suitable, that the required technical background information (e.g., profiling and benchmarking) has been provided, and that the software development approach promotes sustainability of the software and employs best practices. At this stage in the process the technical reviewers may contact the applicants for clarification and/or further information.

A technical evaluation report will then be attached to the proposal for the eCSE Review Panel and the feedback will also be forwarded to the applicants for comment prior to the Panel meeting. The technical evaluation report will include a recommendation on whether or not the proposed work is suitable.

The application will then be reviewed by the eCSE Review Panel who will rank each of the proposals and make decisions on which projects to award funding to. The panel will be made up of experts in the scientific and technical areas. The panel will consider the proposal, the technical evaluations, and the applicant's comments (if any) and recommend funding it in full, funding it at a reduced effort level, or rejecting the proposal.

The applications will be reviewed based on the following assessment criteria:

1. The Applicants (Proposed Team Members):
The proposal should provide the track records for the proposed team members who will carry out the work in the proposed project, and demonstrate that they are able to deliver a successful project.

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2. New Communities Justification

Applicants from New Communities should provide enough detail to justify that the scientific area is a New Community to ARCHER.

3. Technical Context:
The proposal should include sufficient technical information related to the proposed project.

4. Benefits:
The proposal should explain why the proposed project is needed and what the expected computational and scientific benefits will be. The proposal should clearly identify the beneficiaries and how they will benefit from this project. The proposal should also explain why ARCHER and/or a future Tier-1 resource is required for the proposed project and how the outcome of the proposed work can benefit the user community.

5. Pathways to Impacts:
The proposal should identify and describe what impact activities will be undertaken to ensure the potential benefits to be achieved.

6. Work Plan:
The proposal should demonstrate the proposed project will be delivered with an appropriate plan for the technical work, management and resources required.

7. Overall:
The proposal should demonstrate a project with high quality and clear objectives is to be undertaken.

The final decisions of the eCSE Review Panel will be sent to applicants including the feedback provided by the panel. Each successful proposal will be provided a named contact within the centralised CSE team. All unsuccessful applicants will be provided with constructive feedback.

For the successful proposals, the projects are expected to start on or after the 1st October 2018, subject to contract and/or agreement.

III. Further Information and Assistance from ARCHER Helpdesk

Please see the eCSE page for the general information about the eCSE call and support. If you have any queries or require assistance regarding the eCSE application, please contact the ARCHER helpdesk: support@archer.ac.uk.

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IV.   Checklist for Your eCSE Application Submission

Your eCSE application should be submitted via SAFE
<https://www.archer.ac.uk/safe>. Please make sure you have:
☐ Filled in the mandatory information using the online application form [Mandatory]
☐ Uploaded your project proposal using the proposal template [Mandatory]
<http://www.archer.ac.uk/community/eCSE/eCSE_ProposalTemplate.doc>
☐ Uploaded the supporting documents if there are any [Optional]