Innovative Manufacturing Processes: Flexible & Reconfigurable Manufacturing Systems

Call type: Expression of interest

Closing date: 16:00 on 26 April 2012

Summary

High-value manufacturing industries enhance the economic competitiveness of the UK, comprising 13% of the UK economy and over 50% of UK exports. Regardless of the industrial sector, UK manufacturing is driven by technological change and intellectual ingenuity. Academic research is a vital component of the UK’s highly-skilled manufacturing pipeline – improving production systems, developing advanced materials, incorporating modern ICT, and training the next generation of manufacturing professionals.

UK manufacturing has increasingly focused upon high-value, low-volume products and processes to remain competitive. In the future, the market will increasingly demand highly “flexible” manufacturing capability – processes with short cycle times and the ability to rapidly and efficiently reconfigure themselves to accommodate new “customised” products. Maintaining productivity and reliability, whilst allowing flexibility and adaptability, is a major technological challenge.

EPSRC expects to fund a number of research programmes of up to five years in length, focused on the research challenges that underpin such flexible manufacturing processes. The funded programmes are expected to vary in size according to the demands of the proposed research. A two-stage process (with expressions of interest and full proposal stages) will be used to allocate the funding. This call seeks expressions of interest to submit a full proposal.

The submitted expressions of interest will be assessed at a short-listing panel in May 2012 and those that align most appropriately with the scope for this call will be invited for the full proposal stage. The deadline for full proposals will be in late July 2012 and these will be peer reviewed during August and September 2012. Funding decisions are expected to be made in November 2012.

Background

Via the focus on Innovative Production Processes, EPSRC’s Manufacturing the Future theme works to create, capture and accelerate the benefits from ground-breaking research for future UK manufacturing. Close partnership with the Technology Strategy Board, the High Value Manufacturing Catapult and the Cambridge Institute for Manufacturing has resulted in the publication of ‘A Landscape for the Future of High Value Manufacturing in the UK’, which has identified needs, themes and competencies within UK manufacturing.

Flexible and reconfigurable manufacturing systems are highlighted as an area requiring additional research and development to maximise the benefits to UK
manufacturing industries. Manufacturing the Future therefore seeks to invite proposals for research programmes to address these challenges.

For further information on ‘A Landscape for the Future of High Value Manufacturing in the UK’, please see: http://www.innovateuk.org/_assets/pdf/publications/TSB_IfM_HighValueManufacturingT12-009%20FINAL.PDF

Scope of the Call
Three inter-linked research domains have been identified as critical to addressing the challenge of flexible and reconfigurable manufacturing systems. Proposals must address one or more of the areas below in a coherent programme of innovative research:

- **Reconfigurable Assembly Systems**, whereby the objective is to standardise both the methods of production system design and the machine units to enable a modular approach towards production system construction. Ultimately, fully integrated component production and assembly systems would be able to be rapidly assembled, involving seamless integration of heterogeneous manufacturing technologies. For example, research topics could include:
  - Co-operative production machines and control systems
  - Adaptive planning and control solutions and architectures
  - Incorporation of IT Systems, sensors and measurement technology

- **Self-Adaptive Equipment**, allowing improved manufacturing process capability, reduced manufacturing cost, and greatly decreased product changeover times. Tools, jigs and fixtures must be capable of dealing with the evolution of products and production methodologies, minimising the need for process-specific manufacturing equipment. For example, research topics could include:
  - Novel adaptive tooling, fixturing and jigging architectures
  - Incorporation of in-line metrology-control
  - Real-time non-destructive evaluation technologies

- **Automation and Mechanisation**, enabling safe and efficient co-working of human operators and automated systems in a customisable/modular production environment. For example, research topics could include:
  - Human/machine interface
  - Real-time process analytics and control
  - Novel automated manufacturing processes

Funding available
EPSRC expects to fund a number of research programmes that should vary in size between £1M-£2.5M, according to the demands of the proposed research.

Proposals should incorporate an appropriate ethos of flexible funding, giving consideration to a proportion of the requested budget being used for activities such as feasibility studies, relevant networking, and realisation of a broad pathway to impact.

Management structures for proposed research programmes should be clearly articulated from the outset, to allow the programme to achieve the stated research objectives (including outlining structures for independent advice and
oversight, deployment of financial and people resource, and increasing user engagement).

Co-creation of proposals with industry and other research users is vital to Manufacturing the Future. All proposals must be supported by at least one industrial project partner, and their support for the proposal clearly articulated. It is anticipated that proposals will have multiple project partners and, if appropriate, proposals will be multi-sectoral in their potential application. Engagement with the High Value Manufacturing Catapult is encouraged, if appropriate to the application.

**Equipment**

EPSRC has limited funding for capital equipment. Where possible, researchers are asked to make use of existing facilities and equipment, including that may be available within the High Value Manufacturing Catapult or other universities.

If equipment is needed as part of the research proposal, applicants must consider new rules for requesting equipment over £10,000 in value. Individual items of equipment up to £135,668 (inc. VAT) can be included on research proposals submitted through this call, but research organisations will normally be expected to make a significant contribution to the cost.

Single items of equipment above £135,668 (inc. VAT) must be assessed through the strategic equipment peer review process, outside of this call. For more information on equipment funding, please see: http://www.epsrc.ac.uk/ourportfolio/themes/researchinfrastructure/subthemes/equipment/Pages/default.aspx

**Eligibility**

For information on the eligibility of organisations and individuals to receive EPSRC funding, see the EPSRC Funding Guide: http://www.epsrc.ac.uk/funding/apprev/basics/Pages/fundingguide.aspx

Although this call is a targeted funding opportunity, EPSRC will only accept applications from UK Higher Education Institutions (HEIs).

**How to apply**

**Assessment process**

There are two stages in the assessment process:

**Stage 1 – Expression of interest (EoI)**

Applicants should complete the Expression of Interest form. At this stage, we will not accept any other documents such as annexes, a work plan or letters of support.

The four-page EoI contains the following sections:

- Applicants (including industrial partners).
- Research challenge.
- Proposed programme.
• Brief management structure as appropriate to the research programme requested.

• Summary of resources (including equipment to be requested, if any).

**Submitting an EoI**

Please fill in the correct EoI form and send it by email to: FRMSCALL@epsrc.ac.uk

**EoI assessment criteria**

The EoI will be assessed on the following assessment criteria:

• Fit to the scope of the call as described in this document, including the ability to address key features (e.g. strategic fit to the research challenges, strong engagement with research users and credible pathway to impact).

• Suitability of the proposed research methodology with intended outputs and deliverables.

• Strength of the research team, and suitability of any project partners.

• Suitability of management arrangements. A project plan is not required at this stage.

**EoI assessment process**

An EPSRC panel (with independent representation) will short-list the EoIs based on the information provided, and by assessing how the research ideas resonate with the criteria listed in the scope of the call.

Applicants of shortlisted EoIs will then be invited to submit a full grant proposal subject to any specific advice or guidance that the panel may recommend to optimise the proposed research and its alignment to the scope of the call.

We reserve the right to reject proposals that are substantially outside the scope of the call or wholly beyond the remit of EPSRC without reference to peer review.

**Stage 2 - Full proposals**

After short-listing the Expressions of Interest, EPSRC will invite a number of applicants to prepare and submit full proposals. The full proposal should expand on the research challenge and proposed work programme as summarised in the EoI, and also should include:

• Track record of the applicants, justification of the added value offered by the assembled collaborative team and how this grant will complement the group’s other activities.

• Full details of the involvement of project partners (e.g. industrial collaborators and other research users), including contributions being provided by these organisations and their role in transfer of research outputs into practice. Letters of support should be included as appropriate.

• Statement of national importance.

• Statement of pathways to impact, and appropriate requested resources.
• Details of ensuring maximum usage for large equipment (if requested).

• Detailed arrangements for project management in terms of milestones and deliverables.

• The full proposal should contain a Case for Support including a Track Record, Work Plan, Justification of Resources and the Pathways to Impact document. Please add CVs (where applicable) and statements of support from collaboration partners.

If your proposal exceeds the standard page limit or does not conform to this format, your proposal will not be considered.

Please note that EPSRC reserves the right to reject a full proposal where the resources are substantially different from those indicated in the EoI form or where there have been other significant changes from the EoI.

For guidance on format and advice on writing proposals see: http://www.epsrc.ac.uk/funding/apprev/preparing/Pages/default.aspx

**Submitting a full proposal**

Both single and multi-institutional bids are invited. However, proposals must be submitted on one common Je-S proposal form even if they are multi-institutional bids.

You should prepare and submit your proposal using the Research Councils’ Joint Electronic Submission (Je-S) System (https://je-s.rcuk.ac.uk/).

When adding a new proposal, you should select:

• Council ‘EPSRC’

• Document type ‘Standard Proposal’

• Scheme ‘Standard’

• On the Project Details page you should select the ‘Flexible and reconfigurable manufacturing systems’ call.

Details of which research organisations have registered to use Je-S are available from http://www.so.stfc.ac.uk/jes/jes1/RODetails(Web).pdf.

Note that clicking ‘submit document’ on your proposal form in Je-S initially submits the proposal to your host organisation’s administration, not to EPSRC. Please allow sufficient time for your organisation’s submission process between submitting your proposal to them and the call closing date. EPSRC must receive your application by 16:00 on the closing date of the call.

Guidance on the types of support that may be sought and advice on the completion of the research proposal forms are given on the EPSRC website (http://www.epsrc.ac.uk/funding/apprev/Pages/default.aspx) which should be consulted when preparing all proposals.

**Full proposal assessment criteria**

The assessment of proposals and the decisions will take account of the priorities and interests of EPSRC and the scope of the call.
In addition to ensuring that the programme of proposed research fits within the scope of the call and addresses any recommendations made by the panel (based on the EoI submission), full proposals will be assessed on:

- Quality and excellence of the proposed research including novelty, timeliness, ambition and appropriateness of the proposed methodology.
- National importance and how the research underpins or contributes to manufacturing challenges and emerging industry.
- The pathway to impact and effectiveness of the activities identified to help realise these impacts, including the resources requested for this purpose.
- Applicant ability to deliver the research and balance of skills within the research team.
- Appropriateness of resources requested (including equipment usage or access arrangements) and management plans.

**Full proposal assessment process**

Full proposals will be sent to independent peer reviewers, including at least one nominated by the applicant. The postal peer reviewers’ role will primarily be to comment on the quality of the research. Those with sufficiently favourable reviewers’ comments will be invited to respond to the reviewers’ comments and then rank-ordered against each other via a prioritisation panel.

This panel, including independent assessors and observers from EPSRC, will consider the proposals. The panel will be asked to make recommendations to the funding body. The panel will rank the proposal against the full assessment criteria, using the reviewer comments and PI response.

**Guidance**

**Guidance on writing application**

For advice on writing proposals see: [http://www.epsrc.ac.uk/funding/apprev/preparing/Pages/default.aspx](http://www.epsrc.ac.uk/funding/apprev/preparing/Pages/default.aspx)

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Please note the RCUK policy for equipment procurement and funding of new research equipment will apply to this call, where;

a) Individual items of equipment below £10,000 should be included in proposals for individual research projects and will be paid at 80% FEC. They should be included in Other Directly Incurred costs. If VAT and/or Import Duty do not apply, a value of zero should be entered in these fields.

b) Individual items of equipment between £10,000 and £135,668 (inc. VAT) should be included on proposals for research projects. Additional
justification, and details of the proposed contribution to the cost of the equipment, must be provided in the justification of resources.

c) Individual items of equipment above £135,668 (inc. VAT) should not be included on proposals for research projects. Instead, an individual application for these items of equipment must be submitted as a separate proposal which, if successful through an outline stage, will be judged by a Strategic Equipment Panel. The expectation is that the equipment will underpin the research programme including both existing and potential future research projects.

For full details on equipment assessment, please see the guidance on the EPSRC website:
http://www.epsrc.ac.uk/ourportfolio/themes/researchinfrastructure/subthemes/equipment/process/Pages/default.aspx

Guidance for reviewers
Information about the EPSRC peer review process and guidance for reviewers can be found at:
http://www.epsrc.ac.uk/funding/apprev/review/Pages/default.aspx

Additional grant conditions

In addition to the standard terms and conditions for grants, successful applicants will be required to:

(a) have a signed collaboration agreement between HEIs in place before the grant starts.

(b) have a signed collaboration agreement with any project partner before that specific collaboration begins.

There will also be a requirement for the investigators to carry out a mid-term review of the activities funded through the grant.

Key dates

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<th>Date</th>
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<tr>
<td>Call Launched</td>
<td>28 February 2012</td>
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<tr>
<td>Closing date for expressions of interest</td>
<td>26 April 2012</td>
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<tr>
<td>Short-listing panel for expressions of interest</td>
<td>May 2012</td>
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<tr>
<td>Call opens in Je-S for full proposal stage</td>
<td>June 2012</td>
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<td>Closing date for full proposals</td>
<td>Late July 2012</td>
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<td>Postal peer review</td>
<td>August 2012</td>
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<td>Prioritisation panel for full proposals</td>
<td>November 2012</td>
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<td>Grants announced</td>
<td>December 2012</td>
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Contacts
For information relating to the technical scope of this call, or the suitability of any given consortium, please contact:

Dr. Derek Gillespie
Manufacturing the Future Portfolio Manager
☎: 01793 44 4301
✉: derek.gillespie@epsrc.ac.uk

Dr. Stephanie Lewis
Manufacturing the Future Portfolio Manager
☎: 01793 44 4097
✉: Stephanie.lewis@epsrc.ac.uk

For information relating to the process of submission of a full application, or other technical queries upon submission, please contact:

Joint Electronic Submission (Je-S) System Helpdesk
☎: 01793 44 4164
✉: JeSHelp@rcuk.ac.uk

Applicants are asked to consult with their respective university research offices in advance of submitting proposals to this call, and to be clear as to their institutional requirements in relation to meeting the deadlines for this call.

Change log

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