CIMComp
EPSRC
Future Composites
Manufacturing Research Hub

Industrial Engagement Strategy

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1 Introduction

This Industrial Engagement strategy describes the principles, framework and anticipated arrangements for industrial engagement with the EPSRC Future Composites Manufacturing Research Hub (CIMComp). The strategy supports the Hub's objectives to:

- Promote a step change in composites manufacturing science and technologies.
- Create a pipeline of next generation technologies addressing future industrial needs and develop the national composites strategy
- Provide doctoral training for the next generation of composites manufacturing engineers
- Build and grow the national and international composites communities

2 Our Vision

The Future Composites Manufacturing Research Hub is a £10.3m investment by the EPSRC which seeks to engage academics from across the UK to deliver a step-change in the production of polymer matrix composites. Industrial collaboration is critical to this goal, and evidence of this engagement can be seen across the range of projects and activities funded by the Hub. We are pleased to be supported by 4 High Value Manufacturing Catapult Centres and 18 leading companies from the composites sector, collectively offering a further £12.7m in additional support. By establishing a framework for engagement, we aim to create a collaborative environment where fundamental research can be developed with industry support and involvement.

3 Scope

The Industrial Engagement Strategy aims to provide information to current and potential partners and Hub members who seek to engage with them. It is therefore relevant to all academic researchers, business development staff and postgraduates who engage with industry.

4 Hub Governance

4.1 Advisory Board

The Hub Advisory Board (AB) comprises senior representatives from academia, industry, HVM Catapult centres and funding bodies. The AB was established to advise the Management Board in the following areas:

- Reviewing, monitoring and benchmarking the research programme against international norms
- Ensuring effective development of the EPSRC Hub research programme
- Future development strategy and future research directions including informing on future calls for proposals
- Monitoring the action plan developed prior to and following the mid-term review
- Impact and commercial exploitation of research outputs
- Developing and maintaining a risk register and risk mitigation strategy

The Advisory Board meets twice a year wherever appropriate (usually alternating between the University of Nottingham and the University of Bristol). It may be asked to input via email or teleconference if required between the six-monthly meetings. As the AB is an advisory body, it will decide on recommendations to put forward to the Management Board for approval and implementation. A majority vote will approve reports and recommendations with each member having a single vote. Anyone with a conflict of interest on any given voting matter should abstain. The Chair will retain a casting vote. The current AB membership is as follows:

Name	Institution	Role
Prof Mike Hinton	HVM Catapult	Advisory Board Chair
Tim Wybrow		Industrial rep 1
Dr Enrique Garcia	NCC	Industrial rep 2
Dr Warren Hepples	Luxfer Gas Cylinders	Industrial rep 3
Amir Rezai	BAE Systems	Industrial rep 4
Andy Smith	Gordon Murray Design	Industrial rep 5
Dr Rob Backhouse	Rolls-Royce	Industrial rep 6
Tom James	Hexcel	Industrial rep 7
Craig Carr	GKN Aerospace	Industrial rep 8
Adrian Gill	Vestas Wind Systems A/S	Industrial rep 9
Stefanos Giannis	National Physical Laboratory (NPL)	Industrial rep 10
Prof Veronique Michaud	Ecole Polytechnique Fédérale de Lausanne, CH	Scientific expert 1
Prof Remko Akkerman	University of Twente, NL	Scientific expert 2
Dame Prof Jane Jiang	University of Huddersfield & EPSRC Future Metrology Hub	Scientific expert 3
Prof Ian Kinloch	University of Manchester	Scientific expert 4
Prof Nick Warrior	University of Nottingham	Hub Director
Prof Ole Thomsen	University of Bristol	Hub Deputy Director
Dr Thomas Turner	University of Nottingham	Hub Deputy Director
Dr Lee Harper	University of Nottingham	Hub Manager
Naomi South	EPSRC	Funding Body

4.2 Strategic Development Committee (SDC)

The Strategic Development Committee's remit is specifically to develop the knowledge to evolve the Hub's priority areas, identify potential research partners, identify and coordinate access to external funding sources, influence funding priorities and align the Hub's activity to meet stakeholder objectives.

The SDC links potential funding routes and current, past and future hub projects. The Strategic Development Committee will be chaired by the Deputy Director for Research & Operations, and supported by a dedicated Business Development Manager, industrialists with experience of collaborative R&D, alongside EPSRC and Innovate UK representatives and the Hub Manager.

The Strategic Development Committee will identify potential funding streams and specific calls that can be used to fund developments to support Pathways to Impact, providing direct support to the

Knowledge Exchange Committee who work closely with the Hub's industrial partners. The committee meets quarterly, but more recently has focused on individual meetings with committee members to deliver more specific objectives.

The objectives of the SDC include:

- Identification of opportunities to leverage funding from various sources (e.g. Horizon Europe, Clean Aviation, Innovate UK, ATI, AMSCI, EPSRC) and propose actions to secure funds from these sources
- Conducting technology and capability road mapping activities in association with the CLF to develop the Hub and UK national strategies, which will in turn influence funder priorities
- Identify destinations for future international missions to inform Hub priorities and build partnerships.
- Advising the Management Board on funding strategy & inform future calls for proposals
- Supporting highly successful Feasibility Study projects which do not gain Hub core project funding through the development of bids for external funding

The current SDC membership is as follows:

Name	Institution	Role
Dr Tom Turner	University of Nottingham	Deputy Director & SDC Chair
James Whyman	University of Nottingham	Hub BDM
Dr Simon Quinn	University of Bristol	Hub BDM
John Morlidge	Innovate UK	Advisor
Stefanos Giannis	National Physical Laboratory (NPL)	Advisor
Paul Glossop / Isabelle Candy	Department for Business, Energy & Industrial Strategy (BEIS)	Advisor
Philippa Oldham	Advanced Propulsion Centre (APC)	Advisor
Ryoko Morishima	Airbus	Advisor
Naomi South	EPSRC	Advisor

4.3 Knowledge Exchange Committee (KEC)

The Knowledge Exchange Committee's remit is to develop and manage the industry and Catapult interface, looking to monitor user financial involvement and increase leveraged contributions through partnership growth.

The Knowledge Exchange Committee capture and record emerging IP from the Hub and identify technology push-pull opportunities where Hub project outcomes can either be progressed through the HVM Catapult Innovation Spokes or exploited directly by industry stakeholders. This also includes identification and reflection on trends in the UK composites business that require a response from the Hub to ensure that emerging technology demands can be met. The Knowledge Exchange Committee works closely with the Strategic Development Committee to support its role in identifying funding sources to meet these emerging technology demands.

The Knowledge Exchange Committee's objectives include:

• Identification of technology push-pull opportunities where Hub project outcomes can either progress through the HVM Catapult Innovation Spokes or be exploited directly by industry stakeholders.
• Identification and reflection on trends in the UK composites business that require a response from the Hub to ensure that emerging technology demands can be met.
• Maintaining an IP register that captures emerging IP and takes an initial view on whether the IP could be protected through the patenting process or in other ways.
• Act as a clearance committee for reports, papers or presentations intended for external publication to ensure that emerging protectable IP is captured and not inadvertently released. A KEC sub-committee will be set up to ensure no significant delays in clearing papers for publication.
• Publishing an annual cumulative IP report documenting the IP arising from the Hub for all stakeholders
• Assisting in the administration of the NCC Technology Pull Through fund (a £1.3M in-kind contribution to the Hub), which will support the transfer and development of Hub technologies into the NCC for exploitation with a strong UK industry involvement.
• Management of the Industrial Placement Fund for researchers to spend up to 3 months with industry or Catapults for knowledge exchange and personal development.

The current KEC membership is as follows:

Name	Institution	Role
Prof. Ole Thomsen	University of Bristol	Deputy Director & KEC Chair
Dr Simon Quinn	University of Bristol	Hub BDM
James Whyman	University of Nottingham	Hub BDM
Dr Enrique Garcia	NCC	Catapult Advisor
Dr Matt Scott	NCC	Catapult Advisor
Dr Clara Frias	AMRC	Catapult Advisor
Dr Will Pollitt	MTC	Catapult Advisor
Dr Ton Peijs	WMG	Catapult Advisor
Prof. Mike Hinton	HVM Catapult	Hub Advisory Board Chair
Dr Oriol Galvada Diaz	University of Nottingham	Researcher Network Chair

5 Mechanisms for Industry Engagement

Although engagement with industry can take several forms, there are a number of specific mechanisms which benefit the industrial partner whilst corresponding with the aims and activities of the Hub.

***Sponsorship of a postgraduate studentship**:* Depending on the aims and aspirations of the company, this could take the form of an EngD (Industrial Doctorate) or a PhD. An EngD, delivered through the University of Bristol Industrial Doctorate Centre (IDC), has a more applied research focus and includes a taught component. Students are embedded within the sponsoring company and undertake ten one week long Masters level taught units at Bristol. Sponsorship of an EngD costs £20k p.a. over a period of 4 years.

A PhD is a more fundamental research focused degree where students are based at a university with external supervision from the sponsoring company. Sponsorship of a PhD costs £18k p.a. over 3 years. In both cases, the sponsoring company will have access to university facilities and the expertise of supervising academics. In the case of the PhD programme, the student can also access the IDC taught modules, joining the EngD cohort for these sessions.

Support an existing Hub project: Both Feasibility Studies and Core Projects include opportunities for industrial partners to engage. This can include direct support, such as the sponsorship of a postgraduate student, or in-kind support, which can take several forms. Potential opportunities for in-kind support can consist of (but are not limited to):

- Providing materials to the project
- Allowing access to company facilities or resources
- Offering guidance or expertise (e.g. sitting on a project steering committee)

Develop a Feasibility Study application: Hub Feasibility Studies are short (6 month) studies funded at £50k to develop a novel, high risk composites manufacturing project. Although an academic PI must lead Feasibility Studies, this does not preclude industrial partners from working with an academic to develop a project. This will enable an industrially focused challenge to be addressed through fundamental research. Industrial partners will not be funded directly through the project, although they will benefit directly from the output of the proposed research.

Development of funding consortia: Although this may not directly coincide with ongoing projects, the development of collaborative research projects is fundamental to the objectives of the Hub. In this situation, Hub BDMs will assist in the writing and of managing of proposals, as well as in consortium building.

5.1 Tracking Progress

To assess the progression of interaction with an industrial partner, the Hub has adopted a series of six stage-gates representing progress from inception to realisation. The stages are as follows:

Stage	Description
Initial Contact	Introduction and initial discussion of Hub and partner company
First Meeting	Formal meeting to discuss a potential project or interaction
Technical Input	Involvement from researchers to elaborate on technical detail
Follow-Up	Subsequent contact to refine discussions and address questions
Evaluation & Proposal	Consideration of support for an activity or interaction
Support Leveraged	Support is secured

Currently, this progress is collated by the Hub BDMs and manager using spreadsheets to record each partner's contributions. However, the Hub has plans to implement a CRM (Customer Relationship Management) system which will enable precise data on interactions and progress to be recorded and

interrogated. It will also allow Hub staff to instantaneously access this information whenever required.

6 Industrial Engagement Key Performance Indicators (KPIs)

Of the Hub's KPIs outlined in the original project proposal, three are focused explicitly on industrial engagement:

- Industry support – this refers to the leveraging of contributions from Hub partners who have written letters of support
- Additional leveraged grant income refers to securing external grant funding by Hub members, either with or without industrial involvement.
- Additional industry leveraged income refers to contributions towards Hub projects by companies who are not formal Hub partners. In the case of grant funding, this can also refer to industry letters of support written towards funding proposals where a commitment is made.

Table 6-1. Summary of the target KPIs for industrial support as outlined in the Hub proposal

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Industry support (LoS)	£500,000	£1,500,000	£2,500,000	£4,000,000	£6,000,000	£8,000,000	£8,900,000
Additional leveraged grant Income	£2,000,000	£3,000,000	£5,000,000	£7,500,000	£10,000,000	£15,000,000	£20,000,000
Additional industry leveraged income	£1,000,000	£1,500,000	£2,000,000	£2,500,000	£5,000,000	£7,500,000	£10,000,000

7 Partner Management and Business Development

The Hub business development team act as a contact point for all Hub industrial partners. The team comprises two Business Development Managers, one full-time and based at the University of Nottingham, and one 0.5 FTE (as well as 0.5 FTE at the National Composites Centre) based at the University of Bristol. Both Business Development Managers are also responsible for developing an in-depth understanding of local, national and international sources of follow-on funding at the appropriate TRLs.

Industrial partners will likely have several points of contact within the Hub and often longstanding relationships with Hub members. However, for continuity, each company will be assigned to one of the Hub's business development managers who will act as the lead contact.

This division is performed on a sectoral and geographical basis, ensuring that each BDM is well equipped to understand the challenges faced by industry partners, and to minimise travel time. The current allocation is as follows:

Nottingham BDM (James Whyman)	**Bristol BDM (Simon Quinn)**
Advanced Manufacturing Research Centre	Airbus
Aston Martin	BAE Systems
Bentley	Composites Integration
ESI	Coriolis Composites
Gordon Murray Design	GE Aviation/Dowty
Hexcel	GKN Aerospace
Luxfer Gas Cylinders	National Composites Centre
Manufacturing Technology Centre	Network Rail
M Wright and Sons	Rolls-Royce
Pentaxia	Scott Bader
Sigmatex	
Warwick Manufacturing Group	

8 Joining the Hub

It is expected that as more organisations become aware of the Hub and its objectives, membership of the Hub's industrial partners will evolve and grow. New partners can be defined as those companies who did not write a letter of support at the inception of the Hub but who have confirmed interest in engaging with the project. This can occur both formally and informally.

8.1 Formal

Formal membership enables the organisation to become a recognised industrial partner of the Hub. This infers the same status as companies who provided a letter of support to the Hub. Although there is no cost associated with the partnership, it is expected that the company will support the Hub by providing in-kind support.

Since Hub membership is relevant to organisations of all sizes, it would be unfair to compare industrial partners' support levels. An SME for example is unlikely to be able to commit the same resources as a large Tier 1 or OEM organisation. There is therefore no stipulated value of this commitment. However, it is recommended that these are in line with other organisations of a similar size.

Following a discussion with the company and confirmation of their interest in joining the Hub, a letter of support should be prepared and submitted to the Hub management team. At a minimum, this should outline the nature of the commitment to the Hub with associated financial values. These will be added to the Hub's KPI for leveraged industry contributions, so a measurable value must be provided.

8.2 Informal

It is recognised that it is not feasible for every company to become a full partner and commit to a given value of in-kind support. However, this does not prevent interested parties from supporting individual projects, typically through one of the mechanisms outlined in Section 5. This will likely occur through the project staff themselves, as opposed to the Hub business development managers. Therefore it is the responsibility of the project PI to report these engagements to the management team. Companies who engage in this way can be classed as 'Associate Members', receiving acknowledgement for their contribution without an ongoing commitment to the Hub.

9 Action Plan against KPIs

1. Hub BDMs will assess original industry partner contributions against up-to-date partner priorities (a 'gap' analysis).
2. Hub BDMs to continually grow interest from new industrial partners to offset the gap from original industrial partners' speculative commitments.
3. Hub BDM's to identify industrial partners from new, up and coming and atypical sectors (digital/ IT/ sustainability) to diversify the Hub's portfolio.
4. Hub BDM's to identify start up industrial partners that can be nurtured through the Hub to increase industrial support for Hub projects.
5. Hub BDM's to routinely liaise with existing Hub academic and industrial partners for knowledge of opportunities to collaborate with new industrial partners and ensure a continuous pipeline of activity.

10 Frequency of Review

The Industrial Engagement Strategy will be reviewed biannually at each Hub Advisory Board meeting (currently June and December each year). This will encompass a review of the above action plan, industrial leveraging targets and consideration of potential inclusions/removals from the strategy.