



CALL 2 – APPLICATION FORM & GUIDANCE FOR FEASIBILITY STUDIES

**EPSRC Future Manufacturing Research Hub:
SUSTAIN - Strategic University Steel Technology and Innovation Network**

Call Type: Invitation for Proposals
Closing Date: 16:00: 29th July 2022
Related Themes: Carbon Neutral, Steel Utilisation, Iron and Steelmaking and Smart Steel Processing

1. Summary

The EPSRC Future Manufacturing Research Hub: SUSTAIN is offering up to £300,000 in overall funding, to support a number of Steel Decarbonisation Feasibility Studies at TRL 1-3. We aim to provide at least 3 awards for the second call, up to the value of £50,000 each (80%FEC / funder contribution). Exceptional proposals may qualify for a higher level of funding which will also depend upon the research quality, strength of collaboration, the number of proposed research outputs and the overall contribution to the fundamental grand challenges. The funding is available for novel research in sustainable steel manufacture, smart production and recycling of end products. We would also welcome proposals that address the utilisation of steel with the potential to generate new business models and/or supply chain solutions for the steel industry or that identify policy impediments/requirements for the industry’s transformation. The scope of the call is defined in Section 6 of this document.

The call is open to all UK academics whose institutions are not currently involved with the SUSTAIN project and are [eligible to receive EPSRC funding](#). This excludes individuals or groups that have previously been awarded SUSTAIN Feasibility Study funding, unless the new proposal focuses on a significantly different area of research.

The call is the primary mechanism for new academic collaborators to engage with the SUSTAIN Hub and if successful, provide a springboard to larger follow-on funding. The partnership is motivated to increase collaboration between the current Hub and Spoke Universities (Swansea, Warwick, Sheffield), wider UK academia and the UK Steel industry, including companies within steel production, supply chain and end product manufacturing. This will ensure that a diverse set of knowledge, experience and perspectives are engaged to consider the challenges presented by the grand challenges. In addition to maximising potential research synergies, the call also offers projects access to facilities, equipment and expertise from the Hub and Spoke Universities plus other SUSTAIN partners such as The Henry Royce Centre, AMRC, and MPI among others.

Activity	Date
Call Meeting	Monday 6 th June 2022
Call Officially Open	Wednesday 8 th June 2022
Sandpits	Mid-late June 2022
Closing date for applications	Friday 29th July 2022
Evaluation for shortlist of applications by	Early September 2022
Grants announced and feedback given by	Late September 2022
Projects must start within 3 months in receipt of the offer letter, however, if applicants have COVID related issues or special circumstances, consideration will be given on a case-by- case basis.	

Sponsored by:



Academic Partners:





2. Background

SUSTAIN launched in 2019 as a partnership between Swansea, Warwick and Sheffield Universities and the five major UK steel producers by volume. The shared vision of the SUSTAIN partners is to transform the steel supply chain from a reliance on CO₂ intensive commodity products to a flexible and responsive sector where energy and resources are used and reused far more effectively. This disruptive approach will allow UK iron and steel makers to become world leaders in carbon neutrality and zero waste whilst focusing on functional high value products created via novel approaches to manufacturing. SUSTAIN was co-created with industry and builds on three years of analysis and planning by the primary UK steel makers and the three strategic academic partners. The Hub has recently expanded the network by drawing upon complementary research activities and expertise from the wider UK academic community.

SUSTAIN has ambitious and challenging research goals which through connected innovation vehicles are projected to help double UK steel manufacturers GVA by 2030, boost jobs to 35,000+ and increase productivity by 15%. The future health and sustainability of the industry is key to delivering the UK industrial strategy and its decarbonisation 2050 target. For example, decarbonisation of transport through electrification is dependent upon new stronger and lighter steels that are more resistant to degradation and transforming construction will be steel and glass intensive. To deliver this clean growth SUSTAIN is exploring innovative new ways of recovering and reusing energy currently emitted to atmosphere and closing the materials cycle. SUSTAIN will have a major effect on UK carbon emissions and the application, use and reuse of the world's most recycled and influential advanced material. The SUSTAIN innovation ecosystem (Figure 1) can lead a global change in how we exploit steel, its by-products and energy intensity and welcomes the opportunity to expand this across the UK academic community through this request for transformational fundamental research ideas. This broader network has the potential to transform the UK steel making industry to one of carbon neutrality and zero waste, focused on high value functional products created via entirely new manufacturing approaches.

3. The SUSTAIN Challenge

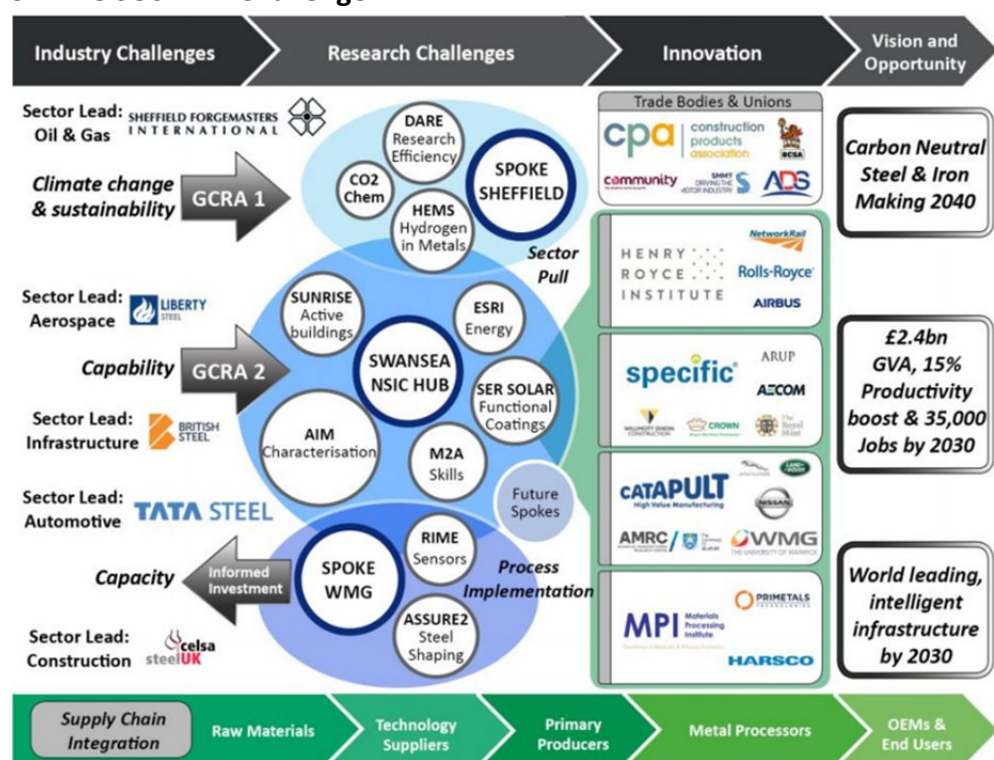




Figure 1: a schematic representation of the current SUSTAIN innovation ecosystem and its objectives.

4. Academic Impact

The SUSTAIN partnership aims to produce significant academic impact to the steel industry as a whole through the application of strong, novel research at the TRL 1-3 level. Through this research it is expected that high value publications, patents and an increased level of academic esteem will be developed for the existing and future partner institutions. The research journey from where we stand in 2022 to the delivery of an actual carbon neutral steel industry will form a close bond between the individuals and groups performing the research that will ensure future collaboration, projects and funding leverage with the industry. The area of focus upon carbon neutrality and digital systems, including Industry 4.0 will enable access to practical training and skill development in key areas for the UK's future success.

5. Technological Impact on UK Manufacturing Research

SUSTAIN will be instrumental in maintaining a leading and differentiated technology base within the UK, which is imperative to securing the future success of the steel industry. Supply chains will also benefit by more secure access to a successful UK steel sector supplying high quality sustainable products and with increased focus on development of the leading-edge products for the future and the technologies pathways to manufacturing. Our model of regional clusters with international standing working with industry is unique and disruptive and builds on the complementary markets the companies serve. It also connects to an established innovation eco-system via the IKC (SPECIFIC), Henry Royce Centre and HVM catapult (WMG/AMRC) together with MPI giving an internationally unique lab to line capability. The five UK steel producers are committed to increase infrastructure investment to £300Mpa aligned to a high-risk research agenda which SUSTAIN can deliver. SUSTAIN encompasses the steel supply chain representing a large proportion of UK manufacturing who will influence the innovation road map.

6. Scope of the Call

Research proposals should address challenges at TRL 1-3 and be aligned with at least one of the priority areas outlined within the Grand Challenges:

SUSTAIN Grand Challenges

- **GCRA 1:** Carbon Neutral Iron and Steelmaking
- **GCRA 2:** Smart Steel Processing

FS Challenge Scope

Proposals should be aligned to the following areas, but we will also accept any high quality, novel proposal related to steel production and use in the UK centred around decarbonisation:

- **Waste Material Flows:** Novel application of plant wastes including CO₂ and legacy materials (previous by-products) that exist on steel making sites
- **Industrial Symbiosis:** Partnerships between steel production and other industries / sectors that result in resource efficiency*



- **Energy:** Energy reduction in processes and the wider UK supply situation through all vectors including water.
- **Financial/Business Modelling for Green Steel:** Development of understanding that assists decision making of the impact to industry and its supply chain when moving to green steel production.
- **Value Intensive Steel Design:** Today's products are tomorrow's scrap. Projects that consider design of steel intensive products that deliver sustainability benefits through their lifetime and are ready for the circular economy are welcome.
- Any novel **Decarbonisation and Recycling** projects that may produce a step change on the path to Net Zero.

*Note that interactions with other foundation industries are covered in calls by the TFI network+ and are excluded from this call.

Proposals should demonstrate the potential to significantly improve the UK Steel Industry's Carbon Footprint through direct changes and augmentation of systems and processes, the introduction of novel technology for materials tracking, disruptive supply chains and closed loop recycling of products. Due to the industrial focus of the project, academics are strongly encouraged to include industrial project partners to facilitate future trials, provide knowledge and experience and demonstrate a pathway to manufacturing and exploitation. The SUSTAIN team is happy to help with contacts in the industry where required.

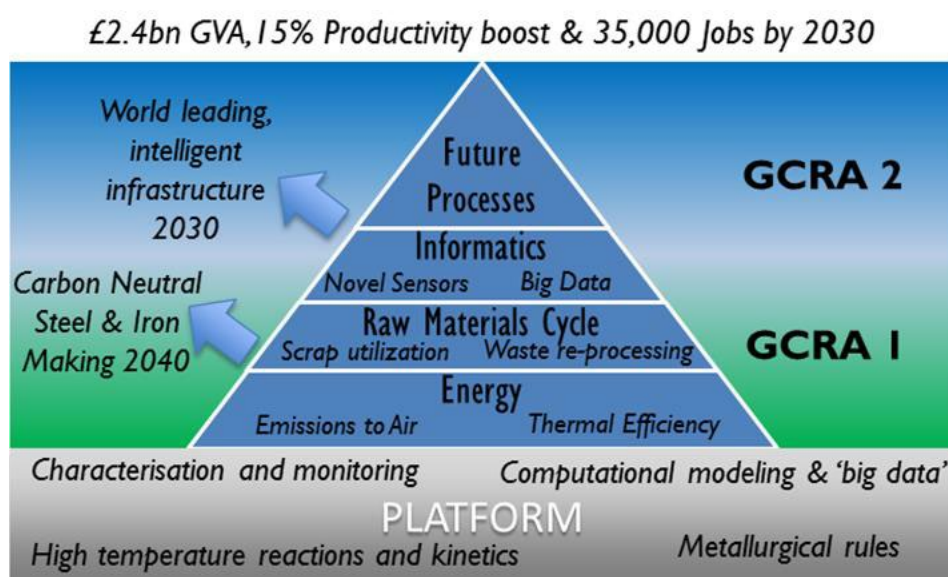


Figure 2: Diagram of SUSTAIN's key thematic areas and underpinning research showing the importance of the ECR platform for delivering the project vision.

GCRA 1: Carbon Neutral Iron and Steelmaking

The SUSTAIN Hub is seeking proposals that may include the development of novel 'waste' recycling and reuse technologies, heat and energy recovery and reuse, alternative reduction of iron ore, alternative materials for fuel and product composition and disruptive technology that may radically change the steel manufacturing process.



GCRA2: Smart Steel Processing

The Hub is seeking proposals to overcome the technical challenges to enabling circular economy loops. This may include the introduction of novel product tracking and identification technology, waste management and reuse, steel property control through thermomechanical processing (eliminating complex alloying methods and increasing the homogeneity of the material for recycling), etc.

Methods of Smart Steel Processing should build upon the UK's industrial strengths and identify methods that are synergistic across industries and through supply chain. The Hub is also seeking proposals to assist in providing the means to alter current business models, develop, maintain and implement a full Life Cycle view for all steel products and develop technology to enable secure product manufacturer identification, energy and CO₂ tracking and recycling count.

7. Funding Available

The SUSTAIN Hub awarded 3 Feasibility Studies across the two Grand Challenge areas in 2020. In line with funding available, SUSTAIN will award up to 3 Feasibility Studies during the second call. **The funding available for each Feasibility Study is £62,500 (FEC); 80% being funded directly from the Hub (i.e. maximum grant per project of £50,000). It is expected that the remaining £12,500 will be contributed by the collaborating institution.** Maximum project length is 6 months (FTE), with funding intended to cover the costs of the PI and supporting researchers in undertaking their research feasibility project. Funding will therefore primarily cover staff time (including associated Indirect and Estate costs), with the remainder supporting consumables and travel. Funding for PhD students is not available. Other funding may be accessible for specialist measurement or limited pilot and upscale trials with our partners at Specific, AIM, Catapult Centres, Henry Royce Institute and MPI, but this must be discussed and agreed in advance with the nominated centre and SUSTAIN team.

8. Equipment

Funding for the purchase of equipment is not eligible.

The Hub, spokes, industrial partners and other affiliated project partners are committed to supporting the UK's research community and have jointly agreed to provide access to facilities, equipment and expertise at cost to proposals funded through this call (subject to terms and conditions agreed on a case-by-case basis). If you believe that your proposal would benefit from access to specialist equipment, please contact SUSTAIN via info.sustainsteel@swansea.ac.uk where your query will be passed to the relevant person.

9. Eligibility

The call is open to all UK academics whose institutions are not currently involved with the SUSTAIN project and are [eligible to receive EPSRC funding](#). This excludes individuals or groups that have previously been awarded SUSTAIN Feasibility Study funding, unless the new proposal focuses on a significantly different area of research.

10. Process for the Applicant to follow for preparation and submission of their proposal

- Attendance at the FS launch meeting (not mandatory but recommended)
- Applicant considers new idea
- Attendance of sandpits in mid-June 2022



- Applicant to discuss proposal with their line manager, confirm letters of support from industry, understand and follow their institutions internal procedures for applying for funding
- Develop proposal and submit by 16:00hrs on Friday 29th July 2022.

11. How to Apply

Please complete in full the application form (Appendix A) of this document.

The guidance and application form includes:

- General guidance
- Practical applicant information to be completed
- Alignment to SUSTAIN Grand Challenges
- FS Challenge Scope
- Proposed start date, duration and flexible working requirements
- The original research or a summary of the state of the art in the field
- The proposed project (with up to x4 A4 sides for completion)
- Contribution to SUSTAIN targets and [KPI's](#)
- Resource requested
- Table information including work package details, work plan (Gantt chart) and current grant proposals

Submission Checklist

- Application form (Appendix A of this document)
- A summary CV of the proposed candidate(s)
- A list of publications from the proposed candidate(s)
- Letter of support from supporting universities / organisations.
- Letter of support from supporting universities / industrialists / organisations where applicable. Partners included in the proposal must provide a letter of support for the applicant to submit with the proposal. Letters should be on headed paper, signed and dated and submitted with your application.

12. Assessment Process

Submissions will be considered by a panel consisting of Hub Investigators supported by independent assessors to ensure a fair and unbiased process. In order of importance, the evaluation criteria for applications will be:

- 1. Fit to Scope:** Does the proposal address one or more of the topics outlined in the call scope and is the proposal at an appropriate TRL?
- 2. Research Quality:** Is the proposal likely to result in high quality research outcomes, in the form of journal publications, patents etc.?
- 3. Novelty:** Does the proposal contain genuine scientific novelty and is the work timely? Is it being addressed elsewhere?
- 4. Relevance:** Is the proposal relevant to the interests of industrial partners or represent the opportunity to significantly improve the U.K.'s manufacturing capability?



5. Ambition: Does the proposal offer suitable levels of challenge, ambition and risk? High-risk, high return studies are encouraged.

6. Impact: Is the approach credible and will the team be able to deliver? If feasibility is demonstrated is there potential for developing a larger collaborative project, either at a similar fundamental level or at higher TRLs?

7. Planning: How well has the proposal been planned? Are the requested resources appropriate to deliver the proposed programme within the timeframe and have they been fully justified?



13. Equality & Diversity

SUSTAIN is committed to supporting and promoting equality and diversity in all of its practices and activities. We aim to establish an inclusive environment and welcome diverse applications from all protected characteristics. We particularly encourage applications from women, as this cohort is under-represented in engineering across academia and industry.

14. Terms & Conditions of the award

Successful applications will be required to enter into a legal binding agreement with Swansea University that will incorporate the [UK Research and Innovation standard terms and conditions](#) of the grant.

15. GDPR

The data you provide will be utilized and deleted in alignment with GDPR requirements, by following the [SUSTAIN Privacy Policy](#).

16. Contacts

Applicants are asked to consult their university's research office ahead of submitting a proposal to this call, in order to be clear of the requirements for meeting the deadlines set out in page 1 of this document. The award is contractually and financially from Swansea University to the University in question. If you have further questions, please e-mail info.sustainsteel@swansea.ac.uk

Completed forms must be submitted electronically in **PDF format** to:

Info.sustainsteel@swansea.ac.uk

Proposals must be submitted by 16:00, Friday 29th July 2022 in good time for the SUSTAIN team to arrange evaluation and outcomes of the proposals in the new academic year.

The SUSTAIN team will acknowledge receipt of each proposal and assign a unique number.

17. Application Form

Please refer to Appendix A below for Application Form. An editable Word version is also available.



Appendix A

SUSTAIN Feasibility Study Call 2 Application Form Summer 2022

General Guidance:

The Call is competitive, so application authors are therefore recommended to closely study the guidance within this Call Document and ensure that their proposal clearly addresses the aspects that will be assessed – See Section 12 of this document - Assessment Process.

Successful proposals will vigorously enact the objectives and intent of SUSTAIN. **This call for funding will place special emphasis on providing novel research ideas and collaboration with academics and industrialists not currently involved in steelmaking and its supply chains. This does not however prevent collaboration of steelmaking and supply chain research parties with the above.** Please discuss any questions with a member of the SUSTAIN team who can be contacted by emailing: info.sustainsteel@swansea.ac.uk

Submission Checklist:

- Application form (Appendix A of SUSTAIN FS Call 2)
- A summary CV of the proposed candidate(s)
- A list of publications from the proposed candidate(s)
- Letter of support from supporting universities / industrialists / organisations where applicable. Partners included in the proposal must provide a letter of support for the applicant to submit with the proposal. Letters should be on headed paper, signed and dated and submitted with your application.

Project / Research Title:

PROPOSAL No

Leave this section blank.
The team will insert a unique identifier number for your proposal.

1. Candidate Name(s):

Name of candidate	E-mail	Status – PI or Co-PI	Institution / Organisation name

2. Contact Details of Research Officer / Support to Lead PI involved in this proposal:

Name	E-mail	Telephone



3. Host Institution(s):

Hosting institution name	Web address	Name of technical host	E-mail

4. Partners (if applicable):

Institution	Institutional web pages	Name of point of contact	E-mail

5. Grand Challenges: Insert "M" for main theme and "S" for secondary theme(s)

Carbon Neutral Iron and Steelmaking		Smart Steel Processing	
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FS Scope Challenges: Insert "M" for main theme and "S" for secondary themes

<ul style="list-style-type: none"> • Waste Material Flows: Novel application of plant wastes including CO₂ and legacy materials (previous by-products) that exist on steel making sites. 	
<ul style="list-style-type: none"> • Industrial Symbiosis: Partnerships between steel production and other industries / sectors that result in resource efficiency* 	
<ul style="list-style-type: none"> • Energy: Energy reduction in processes and the wider UK supply situation through all vectors including water. 	
<ul style="list-style-type: none"> • Financial/Business Modelling for Green Steel: Development of understanding that assists decision making of the impact to industry and its supply chain when moving to green steel production. 	
<ul style="list-style-type: none"> • Value Intensive Steel Design: Today's products are tomorrow's scrap. Projects that consider design of steel intensive products that deliver sustainability benefits through their lifetime and are ready for the circular economy are welcome. 	



<ul style="list-style-type: none">Any novel Decarbonisation and Recycling projects that may produce a step change on the path to Net Zero.	
<ul style="list-style-type: none">Other	

Industrial Sector(s) / Area of Relevance to Steel: State main area of focus, e.g. steel making primary, supply chain, raw materials etc

6. Proposed Start Date, Duration and Style of Working:

Projects are expected to last no longer than 6 months (Full Time Equivalent) and start within 3 months of the award letter. In exceptional circumstances, provision for a later start may be considered. Please identify below if your research can be completed remotely and if you need to include laboratory research.

Start Date	Duration	Remote Working Only	Laboratory Working Only	Remote & Laboratory Working Combined

7. The Original Research: State the original research principles from which your proposal is based. Original Research to be written within x1 A4 page plus additional page/s for references.

Ref 1:

Ref 2:

Ref 3:

Ref 4:

8. The Proposed Project

The proposed project **must be within x4 A4 pages** in single-spaced typescript in Arial 11 or other sans serif typeface of equivalent size, with margins of at least 2cm. It is recommended that this section includes:

- Main technical aims
- Proposed hosting arrangement
- Key activities and outputs
- Synergies of the partners and collaborators
- IP if relevant to this proposal
- Benefits arising from the research

9. Contribution to SUSTAIN Targets and KPI's:

State how this research will benefit the steel industry, contribute to net zero carbon emissions, increase supply chain efficiency & generate publications etc. Please state the KPI's of your own project and show how they align with the overall KPIs of SUSTAIN. Please visit the [SUSTAIN website](#) for [KPI](#) information.



10. Resources Required:

This section needs to show a clear understanding of the costs required for the project, including additional support from partners and third parties which may include pilot-scale demonstration and other potential funding received or required. Credit will be given for external funding or in-kind support e.g. from industry or other sources.

We recognise that proposals that have significant materials, laboratory or international travel costs are likely to need to identify funding contributions outside the SUSTAIN proof of concept funding to meet these needs. The SUSTAIN budget does not include these. Credit will be given for identifying external funding that complements the SUSTAIN funding.

The SUSTAIN funding will primarily cover staff time (including associated Indirect and Estate costs), with the remainder supporting consumables and travel. Funding for PhD students is not available.

Please complete the table below, add additional rows if required and provide narrative where appropriate.

	100% Full Economic Cost	80% Full Economic Cost	Comments if required
Staff Time			
Staff Time			
Travel & Subsistence			
Consumables			
Indirect Costs			
TOTAL			

Narrative if applicable:

11. Tables

The purpose of this section is to provide numerical information in a consistent form across all proposals in terms of project planning and delivery.



11.1 Work Packages within your project

WP No	Work package name	Start month	End month	Output
WP 1		e.g. Month 1	e.g. Month 3	
WP 2				
WP 3				
WP 4	Add or delete rows as necessary.			

11.2 Gantt chart showing top level duration and interaction of your proposal.

11.3 Key Performance Indicators (KPIs): To be written by applicant in support of this proposal and to include papers, patents and industrial benefits as applicable.

11.4 Grant Proposals: Include additional proposals that are related to or in support of the proposal given in this document.

Grant proposals to:	Funding Already Awarded in support of this proposal (£K)	If applicable, possible Future Funding in support of this proposal - Pending Award Results (£K)
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	Means how much you have already secured in successful additional proposals	Means how much you are forecast to secure if you are successful in any outstanding additional

Completed forms must be submitted electronically in **PDF format** to: info.sustainsteel@swansea.ac.uk

Proposals must be submitted by **Friday 29th July 2022, 16:00 hrs.**

We will acknowledge receipt of each proposal and assign a unique number. Queries should be sent to: info.sustainsteel@swansea.ac.uk

END

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