



Summary of Call: Enabling Research in Smart Sustainable Plastic Packaging

Closing date	Outline proposals: 17 March 2020 Full proposals: 30 June 2020
Funding available	Up to £8m
Funding mode/stream	Industrial Strategy Challenge Fund
NERC Core or UKRI/Collective Fund budget	UKRI Collective Fund – ISCF
Project duration	18 - 36 months
Start date requirements (if applicable)	Grants to start from: 1 November 2020 for projects of maximum duration (later start dates will be considered for shorter duration projects)
Call aims and objectives	<p>The purpose of the Enabling Research workstream is to support research that addresses widely understood problems in relation to plastic packaging, whose solutions are unknown today, but which if solved will unlock existing barriers to fundamental systems change, and make an important contribution to achieving the objectives of the SSPP Challenge.</p> <p>The overall aim of the SSPP Challenge is to establish the UK as a leading innovator in smart¹ and sustainable plastic packaging for consumer products, delivering cleaner growth across the supply chain, with a significant reduction in plastic waste entering the environment by 2025.</p> <p>The outputs of the Enabling Research work stream will deliver sustainable environmental, societal and/or economic benefits, compared with current systems. Within this call, UKRI will seek to support a breadth of research projects from across the plastic packaging supply chain to create a balanced programme that addresses current knowledge gaps hindering</p>

¹ Smart in this context is taken to mean packaging including technologies that provide protective functionality such as moisture or oxygen control (active packaging) and that can communicate product information e.g. storage or reprocessing information (intelligent packaging).

	<p>transformation of the plastic packaging system. Indicative research themes are:</p> <ul style="list-style-type: none"> • behavioural insights (consumer and business), • supply chain, and business and economic models, • new plastic packaging designs, • new recyclable materials, • recycling technologies and processes, and, • environmental impacts of existing and new plastics. <p>Other research themes that are within the scope of the SSPP Challenge and that will enhance integration of and collaboration across the plastics packaging supply chain may be proposed. Projects can include innovative research on any type of plastic packaging for consumer products (e.g. food, household, cosmetics, medical etc.), but should clearly demonstrate how the proposed research addresses the objectives of the Enabling Research call.</p>
<p>Eligibility criteria</p>	<ul style="list-style-type: none"> • Principal Investigator (PI) must be based in a UK Research Organisation eligible for UKRI funding • Co-investigator eligibility follows NERC rules, including IIASA eligibility. • Where industry partners are involved, organisations must be a UK-based business of any size. • Applicants may submit no more than two proposals to the call as an investigator, only one of these may be as the lead Principal Investigator (for joint proposals, the PI on the non-lead proposal is a Co-I for these purposes).
<p>Call specific requirements</p>	<ul style="list-style-type: none"> • Projects may span multiple research themes • Project teams should draw upon relevant expertise from within and across disciplines, as necessary • Collaborative project partners are encouraged, where appropriate to the proposed project
<p>Contact</p>	<p>Sara Banning plastics@nerc.ukri.org</p>

Enabling Research in Smart Sustainable Plastic Packaging

Announcement of Opportunity

First Issued: 19 December 2019

This version issued: 29 May 2020

Outline Proposals deadline: 16:00 on 17 March 2020

Full Proposals deadline: 16:00 on 30 June 2020

1. Summary

UK Research & Innovation (UKRI), is inviting proposals under the Enabling Research workstream for projects to establish academic-led research that addresses widely understood problems in relation to plastic packaging, whose solutions are unknown today, but which if solved will unlock existing barriers to fundamental systems change, and make an important contribution to achieving the objectives of the SSPP Challenge.

This call comprises part of an investment under the [Smart Sustainable Plastic Packaging \(SSPP\) Industrial Strategy Challenge Fund \(ISCF\)](#), which aims to establish the UK as a leading innovator in smart and sustainable plastic packaging for consumer products, delivering cleaner growth across the supply chain, with a significant reduction in plastic waste entering the environment by 2025.

The SSPP Challenge outputs will deliver sustainable environmental, societal and/or economic benefits, compared with current systems. UKRI intends to support a breadth of research which responds to current knowledge gaps and will unlock opportunities to transform the plastic packaging system. Indicative research themes have been identified to develop a balanced programme of research activity across the plastic packaging supply chain:

- behavioural insights (consumer and business),
- supply chain, and business and economic models,
- new plastic packaging designs,
- new recyclable materials,
- recycling technologies and processes, and,
- environmental impacts of existing and new plastics.

Other research themes may be proposed, that are in scope and that will enhance the integration of and collaboration across the plastic packaging supply chain. Projects supported by this call should be innovative, with potential to deliver more environmentally, socially and/or economically sustainable approaches to plastic packaging design, manufacture, use, and end-of-life recovery of value, bringing together research expertise within and across disciplines, and co-created with industry, where appropriate.

The total available budget for this Enabling Research call is up to £8m (80% FEC). UKRI anticipates funding around 10 research projects lasting between 18 and 36 months.

Projects with a maximum duration of 36 months are expected to start from 1 November 2020. Later start dates will be considered for shorter duration projects. All funds must be spent by the end of the SSPP Challenge on 31 March 2024.

This call has an Outline Proposal application stage and a Full Proposal application stage. Outline Proposals must be submitted via the [Joint Electronic Submission](#) (Je-S) system by 16:00 on 17 March 2020. Full proposals must be submitted via Je-S system before 16:00 on 30 June 2020.

2. Background

2.1 Context

Since they were invented in the early 20th Century synthetic plastics have been revolutionary; they have changed the way we live and are now an essential part of everyday life and embedded in the global economy. Packaging for consumer products such as cosmetics, food, drink, toiletries, cleaning products and healthcare products assures authenticity, quality and safety. For many consumer products it is the plastic packaging (bottles, jars, tubes or cartons) that deliver important benefits and barrier properties at low cost, helping to protect against degradation, spoilage or tampering.

Annual global production of plastic now exceeds 300M tonnes, and this is expected to triple by 2050. In the EU, the plastics sector employs 1.5 million people and generated a turnover of EUR 340 billion in 2015. However, the ubiquity and durability of plastic packaging has significant consequences and the UK needs to urgently address growing concern about the environmental impact of plastics in packaging. Plastics use has a number of negative features that need to be addressed to create a more sustainable economy:

- Reliance on CO₂ producing fossil feedstocks: over 90% of plastics produced are derived from virgin fossil fuels, representing about 6% of global oil consumption. If the current strong growth of plastics usage continues as expected the plastics sector will account for 20% of total oil consumption and 15% of the global annual carbon budget by 2050².
- Energy requirements for plastics production: the processes of oil refining and polymerisation of monomers are estimated to account for over 95% of the total energy consumed in plastics production³.
- 95% of plastic packaging material value, \$80-120 billion annually, is lost to the economy after a short first use via landfill, incineration or the environment⁴.
- Significant environmental and human health impacts: each year at least 8 million tonnes of plastics leak into the ocean threatening marine wildlife, this is expected to quadruple by 2050⁵. The potential for contamination of the human food chain also presents human health hazards.

²The Ellen Macarthur Foundation, 2016

³*Ibid.*

⁴*Ibid.*

⁵*Ibid.*

- Negative social and economic impacts are increasingly arising from littering, inappropriate waste disposal and excessive use of plastic materials.

The plastic packaging value chain is highly complex and fragmented. The proliferation of materials, formats, labelling, brand identity, collection schemes, and sorting and reprocessing systems are significant barriers to plastic packaging dematerialisation.

Opportunities exist to radically transform the UK's existing linear manufacturing and consumption pattern. A more circular, sustainable model employing next generation plastics and packaging formats would enhance productivity, shift consumer and business behaviour and minimise the environmental impact of plastic. This requires taking account of local, national and international factors, including: approaches to waste management, supply chains, how plastics behave in different environments, social and cultural attitudes, consumer and business behaviours regarding plastic use, disposal and plastic pollution, economic drivers, and the legal, governance and regulatory context.

2.2 SSPP Programme Background

The SSPP Challenge is funded by the [ISCF](#), the UK Government's flagship challenge-led innovation programme. It is led by UKRI, with an ambition to create transformative opportunities for businesses and sectors across the UK from technological progress and innovation. By creating active and ambitious partnerships between the UK's most innovative businesses and our world-leading research base, the ISCF aims to solve the major industrial and societal challenges of our time.

The aim of the SSPP Challenge is:

To establish the UK as a leading innovator in smart and sustainable plastic packaging for consumer products, delivering cleaner growth across the supply chain, with a significant reduction in plastic waste entering the environment by 2025.

The SSPP programme will mobilise and coordinate collaboration between government, academia and industry across the end-to-end supply chain to deliver more sustainable plastic packaging. The government has ambitious targets, policy and regulation proposals (e.g. [25 Year Environment Plan](#), [Resources and Waste Strategy](#), [Bioeconomy Strategy](#), [Litter Strategy](#)). The Challenge will be catalysed by an investment of up to £60m of ISCF funds allocated over a five-year period 2019-2024.

The SSPP Challenge seeks to deliver sustainable environmental, societal and/or economic benefits. Aligned to the Government's Clean Growth Grand Challenge and ISCF objectives, the SSPP Challenge seeks to make a significant contribution to the UK target of 2.4% of GDP in R&I spend, with SSPP innovation recognised internationally as a UK strength, and source of export growth and inward investment.

The SSPP Challenge has three workstreams, as follows:

- **Core Programme:** Up to £2 million available that will deliver leadership and foster collaboration between industry, academia and government by convening and commissioning workshops and networking activity, and collecting, synthesising and disseminating results from across the SSPP work streams.

- **Enabling Research:** Up to £8m available for a series of grants to establish a balanced portfolio of academic-led research and development to address known problems and knowledge gaps in relation to plastic packaging, working with project partners and actors from across the supply chain, where relevant.
- **Dynamic and Collaborative R&D:** Up to £50m available funding of industry-led multi-disciplinary Collaborative R&D (CR&D) projects, and multi-partner consortia scale-up and deployment of demonstrators to develop new technologies at scale and support their adoption by industry.

The present call relates to the Enabling Research workstream. The call will be managed by NERC on behalf of all UKRI research councils, and Investigators from any discipline supported by UKRI are welcomed and encouraged to apply. NERC individual eligibility rules apply. All proposals received will be shared with other constituent parts of UKRI as necessary to assist with processing.

3. Scope of the SSPP Enabling Research Call

3.1 Aims and Objectives of the Enabling Research workstream

The overall aim of the SSPP Challenge is to establish the UK as a leading innovator in smart and sustainable plastic packaging for consumer products, delivering cleaner growth across the supply chain, with a significant reduction in plastic waste entering the environment by 2025.

The aim of the Enabling Research workstream is to support research that addresses widely understood problems in relation to plastic packaging, whose solutions are unknown today, but which if solved will unlock existing barriers to fundamental systems change, and make an important contribution to achieving the objectives of the SSPP Challenge.

The specific SSPP programme objectives that apply to the Enabling Research workstream are:

1. To deliver innovative R&I to support more sustainable plastic packaging in line with the [UK Plastics Pact](#) targets.
2. To increase UK plastic packaging supply chain collaboration in order to improve sustainability.
3. To increase understanding of environmental impacts of existing and new plastic packaging to inform new and improved design, technologies and processes.
4. To increase understanding of behaviour on the sustainability of plastic packaging to inform new and improved design, technologies, processes and business models.

The SSPP Challenge requires research questions and research outputs to be framed in the context of their impact on activities and environmental consequences across the plastic packaging supply chain (see Annex 1). As an aid to structuring the programme, indicative research themes that span the packaging supply chain are the following:

- Behavioural insights (consumer and business)
- Supply chain, and business and economic models
- New plastic packaging designs,
- New recyclable materials,
- Recycling technologies and processes
- Environmental impacts of existing and new plastics

Other research themes that are within the scope of the SSPP Challenge (see Section 3.3) and that will enhance integration of and collaboration across the supply chain may be proposed. Applicants are encouraged to engage with the business community and third sector organisations and draw upon relevant expertise from across the arts and humanities, engineering, environmental and social sciences to co-create research questions and to consider implications and outcomes for relevant actors across the plastics supply chain.

An illustrative list of research questions and project outputs from this call is provided below. These are by way of examples only. We encourage any proposal that is innovative and meets the scope of the call.

Illustrative Research Areas	Example Projects
<ul style="list-style-type: none"> • Knowledge of the degradation of plastics in different environments and associated ecological and human impacts remains limited, particularly around the behaviour of products described as 'biodegradable'. Intentional biodegradation of plastics may lead to adverse environmental consequences in certain situations. • A comprehensive understanding of the social drivers and societal implications of plastic pollution is lacking. Understanding both is important for developing effective solutions and to create societal acceptance of change • Current life-cycle assessments do not capture all the relevant impacts of plastics along the value chain. Several aspects, including the system boundaries, assumptions and weighting factors, are not restricted, making comparisons between the conclusions of different LCA studies difficult. • Barriers preventing successful implementation of improved packaging alternatives include insufficient understanding of technical performance, incumbent technologies, environmental performance and switching costs and risks. 	<ul style="list-style-type: none"> • Improved understanding of behaviour (consumer and business) on the sustainability of plastic packaging to inform new and improved materials, design, technologies, processes and business models • Improved understanding of the impacts of plastic packaging waste in the environment to inform new and improved materials, design, technologies, processes and business models • Novel materials and processes for more sustainable plastics packaging • Better designed packaging products to minimise waste and maximise end-of-life recovery, while maintaining consumer appeal, including smart packaging • Insights on new approaches to end-of-life recovery, re-use and recycling • Service design methodologies which influence consumer behaviour and address consumer needs to reduce waste, prevent plastic from entering the environment and encourage re-use and recycling • More sustainable business, supply chain and economic models • New methods, standards and regulations for simulating and measuring environmental impacts of plastic packaging materials.

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| <ul style="list-style-type: none">• There is a lack of knowledge about variations in collection and recycling systems, their economics, and their environmental implications vis-a-vis plastic packaging. | |
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3.2 Proposal Requirements

3.2.1 Proposals can include innovative research on any type of plastic packaging for consumer products (e.g. food, household, cosmetics, medical etc.). Proposals should clearly demonstrate:

- The originality and quality of the proposed research, including the problem(s) it will address in relation to plastic packaging and how solutions will unlock existing barriers to fundamental systems change
- How it supports the wider SSPP Challenge objectives
- How the planned outputs will support a reduction in plastic waste entering the environment by 2025.

3.2.2 Research proposals funded under this call are expected to be problem-led, addressing widely understood problems associated with plastic packaging and include a clear articulation of how the outcomes will be exploited in the near term. Proposals should include details of the following, as relevant:

- The environmental, business and/or societal need, technological challenge and/or market opportunity behind your proposed research.
- How the research will deliver new insights around significant influences on consumer/business behaviours to reduce waste, prevent plastic from entering the environment and encourage re-use and recycling.
- How the research fits with, and compliments UK research already funded in the area or related areas across the UKRI Portfolio. Please indicate if you have already received UKRI / Innovate UK funding for previous work.
- Assurance that solutions are conceived to deliver sustainable environmental, societal and/or economic benefits.

3.2.3 As indicated in Section 3.1, the SSPP Challenge is aligned to the targets of the UK Plastics Pact. Research proposals should explain how they contribute towards delivering systemic changes that lead to delivery of UK Plastics Pact targets, relative to the current state of the art. Referring to the supply chain diagram in Annex 1, proposals should describe:

- The activities within the supply chain that your research will inform.
- The ways in which your research project would contribute towards delivering a change in the system, for example a change in consumer behaviour, an increase in recycling rate or elimination/reduction in the use of virgin plastic.
- How this research project would contribute to delivering against one or more of the four targets adopted by the UK Plastics Pact.
- How the research will contribute towards improving the environmental impact of the plastic packaging system, for example by preventing or reducing plastic packaging escaping into the environment, reducing the carbon footprint of the supply chain, enhancing understanding of human health and eco toxicity of

plastics in the environment. There may be trade-offs in terms of environmental benefits and impacts so please identify these where they may occur.

3.2.4 The SSPP Challenge encourages collaboration across the supply chain and financial and in-kind contributions from industry partners to projects grant-funded by this call are encouraged. The extent of formal collaboration between academic disciplines, and between academia and industry or third sector organisations will depend on the problem to be researched. The quality of the research proposals will in part be assessed on the appropriateness of the disciplines and project partners assembled to address the problem. Proposals should include details of the following, as relevant:

- Collaborative partners from academic institutions, industry or the third sector to address the challenges, including enabling future collaborative research, where appropriate to the proposed project.
- Expertise from across research disciplines the project team will be composed of to deliver the proposed research outcomes and address the aims of the wider SSPP programme.
- How research themes are complementary to institutional strengths and strategies, adding value to existing activities.

3.3 Projects we will not fund

We are not funding projects which:

- do not have plastic packaging as the primary focus (refer to definitions in Annex 2)
- encourage or facilitate the export of plastic packaging while still classified as a waste
- use or manufacture either a liquid fuel or a solid fuel, such as refuse-derived fuel or solid-recovered fuel, as the primary product.

UKRI will seek to support a breadth of research projects from across the plastic packaging supply chain to create a balanced programme that addresses the SSPP Challenge objectives applying to the Enabling Research workstream (see Section 3.1).

4 Programme Requirements

4.1 Programme Funding

The total available budget for the Enabling Research workstream is up to £8m (80% FEC). This call aims to support around 10 academic research projects of varying duration. UKRI will consider the range of proposals to ensure a balanced portfolio of projects is supported. Projects with the maximum duration of 36 months are expected to start from 1 November 2020 and must be complete by the end of the SSPP Challenge on 31 March 2024. All funds must be spent by the end of the SSPP Challenge on 31 March 2024.

4.2 Implementation and Delivery

It is expected that projects will start from 1 November 2020 and will last 18 – 36 months, depending on the nature of the research activities.

Investigators from **all disciplines supported by UKRI** are welcomed and encouraged to apply. NERC individual eligibility rules apply. This call will be managed by NERC on behalf of

UKRI. Awards will be made under the standard [UKRI Terms and Conditions](#), and there may be additional call-specific conditions applied to the awards.

The funds available through this call are intended to encourage opportunities for interdisciplinary working and collaboration, where appropriate, so that research questions will address knowledge gaps that are inhibiting the transition to a more sustainable plastic packaging system and considers implications and outcomes across the plastics supply chain. Partnerships, where formed, should be genuine and reciprocal, and proposals must demonstrate that collaborative research activities will add value to that which could be achieved by individual partners working on their own. This may be through enhanced outcomes and impacts, or achieving outcomes at less cost or faster than if working alone.

4.3 Eligibility

All projects are required to have a Principal Investigator based in a UK Research Organisation eligible for UKRI funding.

UKRI research and fellowship grants for all schemes may be held at approved UK Higher Education Institutions (HEIs), approved Research Council Institutes (RCIs) and approved Independent Research Organisations (IROs). Full details of approved RCIs and IROs can be found on the [UKRI website](#).

The funders recognise the importance of, and want to encourage the involvement of, non-academic organisations such as NGOs, local and national policymakers, and organisations representing relevant actors in the plastic packaging supply chain. If a collaborating organisation is integral to the design and delivery of the project and is contributing to the project through financial or in-kind contributions to the grant (e.g. staff time, access to facilities, data, sites) then they should be listed as a project partner.

Project partners – Participating organisations not meeting the criteria to be a Research Organisation and co-investigator can be project partners on the awards based on the following requirements:

- Third sector organisations – NGOs, charities and other non-profit civil society organisations (who are not an eligible research organisation) can be included on proposals as project partners.
- Government departments and business.

Sub-contracts – Sub-contracts are eligible costs on proposals submitted to this call but should only be used for the procurement of goods and services. Sub-contracts are not permitted for research partners providing intellectual input into the project, where a research partner or project partner relationship is more appropriate.

Proposals should state the partner organisations being engaged, including the nature of the contribution to the project. Letters of Support from project partners are required for this call.

It is important to highlight that any UK Research Organisation awarded a grant is responsible for the conduct and administration of that grant. It is accountable for the effective use of public funds, and must therefore ensure that all grant monies are subject to proper financial management processes. It is the Research Organisation's responsibility to ensure that expenditure on collaborations in the UK is subject to robust controls to ensure value for money

and propriety and that all costs should be fully vouched and maintained for possible inspection and checks by, or on behalf of, UKRI.

4.4 Research Roles and Eligibility

Applicants may submit no more than two proposals to the call as an investigator, only one of these may be as the lead Principal Investigator (for joint proposals, the PI on the non-lead proposal is a Co-I for these purposes).

Normal NERC individual eligibility applies. The lead Principal Investigator must be from a UK-based organisation and eligible to hold a UKRI grant. Any co-investigator rules from other UKRI Councils that differ from the NERC rules, do not apply to this call.

IIASA Co-investigator eligibility rules apply to this call. Further details are available at: <https://nerc.ukri.org/funding/application/eligibility/>.

Full information on individual eligibility and role descriptions can be found under Section C of the [NERC research grants and fellowships handbook](#).

4.5 Associated Studentships on a Proposal

Associated studentships (either Masters or PhD studentships) cannot be included on proposals submitted to this call.

4.6 Research Ethics

All ISCF projects must be underpinned by a strong research ethic based on mutual respect and understanding for different cultural, ethnic, social and economic beliefs and practices. Solutions to any development challenge(s) must be rooted in, and acceptable to, the institutions, communities and societies where they will operate.

Ethical issues should be interpreted broadly and may encompass areas where regulation and approval processes exist as well as areas where they do not. Applicants must ensure that the proposed research will be carried out to a high ethical standard and must clearly state how any potential ethical and health and safety issues have been considered and will be addressed, ensuring that all necessary ethical approval is in place before the research commences and all risks are minimised. More guidance can be found in the [ESRC Framework for Research Ethics](#).

4.7 Equality, Diversity and Inclusion

The long term strength of the UK research base depends on harnessing all the available talent. UKRI expects that equality and diversity is embedded at all levels and in all aspects of research practice and funding policy. We are committed to supporting the research community, offering a range of flexible options which allow applicants to design a package that fits their research goals, career and personal circumstances. This includes career breaks, support for people with caring responsibilities, flexible working and alternative working patterns. With this in mind, we welcome applications from academics who job share, have a part-time contract, or need flexible working arrangements. Peer review is central to UKRI funding decisions; we require expert advice and robust decision making processes for all UKRI funding initiatives. We are committed to ensuring

that fairness is fully reflected in all our funding processes by advancing policy which supports equality, diversity and inclusion.

Please see our Equality and Diversity webpages <https://epsrc.ukri.org/funding/edi-at-epsrc/> for further information.

4.8 Knowledge Exchange and Impact

Knowledge exchange (KE) is vital to ensure that environmental research has wide benefits for society, and should be an integral part of any research.

Applicants must briefly outline within the case for support how they will work with relevant stakeholders through the research activity to understand and deliver positive impact in support of the wider SSPP Challenge.

Funded projects may also be required to engage with programme-wide KE activities, in which case appropriate funding for which will be provided by the programme.

4.9 Data Management

The [NERC Data Policy](#) must be adhered to, and an [outline data management plan](#) produced as part of a Full Proposal. Successful projects will need to agree the full data management plan with the relevant Data Centre within 6 months of the grant start date.

Where other specific types of data are also collected, applicants must refer to relevant council guidance for archiving such specific data. For example, if specific social science data is produced, please refer to the full statement on data management planning and datasets deposition requirements for data intensive investments in the [ESRC Research Data Policy](#) and the [Research Funding Guide](#).

4.10 Research Council Facilities

Prior to submitting a proposal, applicants wishing to use a NERC service or facility must contact the facility to seek agreement that they could provide the service required.

Applicants wishing to use most NERC facilities will need to submit a mandatory 'technical assessment' with their proposal. This technical assessment is not required for HPC. For NERC, this means a quote for the work that the facility will provide. A [full list](#) of the Facilities requiring this quote can be found on the NERC website. The costs for the service or facility (excluding HPC costs) must be included within the Directly Incurred Other Costs section of the Je-S form and also within the facilities section of the Je-S form. Further information on [NERC services and facilities](#) can be found on the NERC website.

Applicants wishing to use NERC's marine facilities must contact NERC Marine Planning (marineplanning@nerc.ukri.org) as soon as possible to discuss usage as the proposed start date for grants may preclude the use of these facilities. Note that NERC shiptime cannot be requested through this call. Following discussion with NERC Marine Planning, applicants wishing to use other NERC marine facilities should complete an online Shiptime and Marine Equipment (SME) or Autonomous Deployment (ADF) application form on the [Marine Facilities Planning](#) webpage. The SME/ADF number should be included on the Je-S grant proposal form under Services and Facilities. SME/ADFs must be submitted and approved by

NERC Marine Planning by the time the proposal (Je-S form) is submitted, so that a pdf of the SME/ADF can be attached as a facility form. Failure to do so may result in the request not being included in the NERC Marine Facilities Programme. The costs for the marine facility must be included within the Directly Incurred Other Costs section of the Je-S form and also within the facilities section of the Je-S form.

Completed SMEs/ADFs must be submitted by 28 January 2020 to allow sufficient time for costing and approval.

4.11 Reporting Requirements

Successful applicants will be required to report research outcomes on ResearchFish in line with standard [UKRI Terms and Conditions](#). This is required annually and continues for up to five years post grant end.

In addition to the standard outcomes this call will be subject to standard ISCF monitoring and evaluation procedures. These processes will be overseen by the SSPP Programme Board with input from the SSPP Challenge Advisory Group and managed by the UKRI SSPP programme team.

All projects will be monitored throughout their duration to capture both performance and financial data to inform overall programme evaluation. Monitoring reports will be used to report to the Programme Board, ISCF Steering Board and programme evaluation and benefits realisation.

Project teams will be required to participate in a mid-term review and respond to regular reporting requests from UKRI or the ISCF Steering Board.

The grant holder may be responsible for providing progress reports against non-financial performance metrics. A list of Key Performance Indicators/milestones and deliverables and instructions for reporting will be agreed with the grant holder upon commencement of the grant.

UKRI reserves the right to suspend the grant and withhold further payments if the performance metrics requested are not provided by the stated deadlines or are determined to be of an unacceptable standard by the NERC project officer(s).

Applicants should make an allowance within their resourcing plan and budget to comply with these reporting and evaluation requirements.

5 Application Process

5.1 How to apply

This call has two stages: an Outline Proposal stage and a Full Proposal stage. Any Full Proposals submitted without having approval at the Outline Proposal stage will be automatically rejected.

5.1.1 Outline proposals

Outline Proposals must be submitted via the [Joint Electronic Submission](#) (Je-S) system by 16:00 on 17 March 2020.

The outline proposal stage will be used to identify projects that will be invited to submit a full proposal. The outline proposals will be assessed by an independent interdisciplinary panel of experts. No more than 15 outline proposals will be invited to submit full proposals. Any sift of proposals will be made on the basis of the likely fit of proposals to requirements of the call. The panel will provide brief feedback to applicants summarising why their proposal was successful / unsuccessful. No further feedback will be available.

Although multi-institutional bids are welcomed, only one Je-S application form should be submitted for a given outline proposal. It is the responsibility of the lead organisation to ensure all the documentation required is submitted with the proposal form.

Outline proposals must be submitted using the Research Councils' Joint Electronic Submission system (Je-S). When adding a new proposal, applicants should select:

- Council – NERC
- Proposal Type - 'Outline Proposal'
- Scheme – 'NERC Outline'
- Call – 'Sustainable Plastic Packaging'.

UKRI must receive your outline proposal by 16:00 on 17 March 2020 and it will not be possible to submit to the call after this time. Applicants should leave enough time for their proposal to pass through their organisation's Je-S submission route before this date.

The Je-S outline proposal form should be accompanied by a Case for Support as one attachment. The Case for Support must not exceed 4 sides of A4 in total and should include summary information on the following:

- the proposed research, its context and how it addresses the assessment criteria in Section 6
- a track record to highlight the management capabilities of the team and outline the proposed management structure
- the contribution of project partners, where applicable.

The outline proposal form should include the expected Co-Investigators and their Research Organisations. If successful, some of the Co-Investigators would then become the Principal or Co-Investigators on the component grant proposals and not be named on the lead grant proposal.

Do not upload any other attachments. If submitted they will not be sent to the panel. Please note that this is not intended to restrict detail in the final submission as minor changes will be allowed.

It is the responsibility of applicants to undertake sufficient planning at the outline proposal stage to determine that the full costs of research proposed (including any facility costs) can be accommodated. The Resources indicated at the outline proposal stage are considered as estimates only and may be amended in a subsequent full proposal. No CVs or project partner letters should be submitted at the outline proposal stage.

For advice on writing proposals see: <https://nerc.ukri.org/funding/application/howtoapply/>

5.1.2 Full proposals

Full Proposals must be submitted via the [Joint Electronic Submission \(Je-S\)](#) system by 16:00 on 30 June 2020.

One Full Proposal submission (plus any associated component proposals) is required for each proposed project. The Smart Sustainable Plastic Packaging Enabling Research call will close on Je-S at 16:00 on 30 June 2020 and it will not be possible to submit to the call after this time. Applicants should leave enough time for their proposal to pass through their organisation's Je-S submission route before this date. Any proposal that is incomplete, or does not meet NERC's eligibility criteria or follow NERC's submission rules (see [NERC research grants and fellowships handbook](#)), will be office rejected and will not be considered.

In order to prepare a Je-S Full Proposal submission the person preparing the proposal has to create a new proposal. The process for this is as follows:

- Council – NERC
- Proposal Type - 'Full Proposal'
- Scheme – 'Directed'
- Call – 'Smart Sustainable Plastic Packaging – Enabling Research'.

Proposals for this call should complete the Je-S proforma and attach the documents listed below using the NERC standard grant proposal format (except for reduced page limits for the case for support detailed below) following the requirements outlined in Section F of the [NERC research grants and fellowships handbook](#):

- 1. Case for support (up to 8 sides of A4 total)** – Please provide a case for support outlining the project and its desired outcomes, including previous track record of all Research Organisations and/or project partners involved (up to 2 sides of A4) and a description of the proposed work (up to 6 sides of A4).
- 2. CV (up to 2 sides A4 per CV)** – Please provide a CV for each applicant and named research staff involved in the project.
- 3. Justification of Resources (up to 2 sides of A4)** – A full justification of the resources requested within the proposal. The Justification of Resources should explain how the resources requested (staff time, travel and subsistence costs, and accommodation) are appropriate for the proposal and represent value for money, in reference to the project objectives.
- 4. An outline data management plan (up to 1 side of A4)** – Please identify data sets of long term value that should be made available to UKRI data centres for archiving and reuse at the end of the grant.
- 5. Letters of Support (up to 2 sides of A4 per partner)** – only IF included. Please provide a letter of support for each project partner.

Further details of what documents to provide for the Full Proposal are available within the handbook.

Other considerations

All attachments, with the exception of letters of support and services/facilities/equipment quotes, submitted through the Je-S system must be completed in single-spaced typescript of minimum font size 11 point (Arial or other sans serif typeface of equivalent size to Arial 11), with margins of at least 2cm. Please note that Arial narrow, Calibri and Times New Roman are not allowable font

types and any proposal which has used either of these font types within their submission will be rejected. References and footnotes should also be at least 11 point font and should be in the same font type as the rest of the document. Headers and footers should not be used for references or information relating to the scientific case. Applicants referring to websites should note that referees may choose not to use them.

Please note that on submission to council ALL non-PDF documents are converted to PDF, the use of non-standard fonts may result in errors or font conversion, which could affect the overall length of the document.

Additionally where non-standard fonts are present, and even if the converted PDF document may look unaffected in the Je-S System, when it is imported into the Research Councils Grants System some information may be removed. We therefore recommend that where a document contains any non-standard fonts (scientific notation, diagrams etc), the document should be converted to PDF prior to attaching it to the proposal.

Applicants should ensure that their proposal conforms to all eligibility and submission rules, otherwise their proposal may be rejected without peer review. More details on NERC's submission rules can be found in the NERC research grants and fellowships handbook and in the submission rules on the NERC website.

In order to prepare a Je-S proposal submission, the person preparing the proposal has to log onto Je-S and create a new proposal. Note that this person must have previously created an individual Je-S account for themselves. This should be done well in advance of the application deadline as there may be some delay in the approval of an individual Je-S account.

For the full proposal stage, any individuals that will be named on the application (with the exception of Project Partners and sub-contractors) must have an individual Je-S account for themselves or will need to create an account in order to be added to an application. It is also necessary for an individual's organisation to have been registered before they can register themselves.

Guidance on how to register an organisation and how to create an individual Je-S account can be found on the [JeS website](#).

Associated studentships (either Masters or PhD studentships) cannot be included on proposals submitted to this call.

Projects with a maximum duration of 36 months funded under this Announcement of Opportunity are expected to start from 1 November 2020. Projects of a shorter duration may start later subject to prior approval.

6 Assessment Process

Outlines received prior to the deadline which fit the basic requirements of the call will be assessed by an Assessment Panel who will shortlist those that will be invited to submit Full Proposals.

Outline Proposals will be assessed on:

- Fit to Scheme
- *potential* for Excellence

Outline proposals will be considered by an independent, interdisciplinary assessment panel (note: not an interview panel) with the expertise necessary to assess the proposals against the criteria listed, without additional external reviewers' comments. The panel will be selected by UKRI to reflect the call remit and the need for interdisciplinarity. In addition to considering the recommendations made by the panel, UKRI will consider the overall balance covered by proposals to ensure a broad suite of solutions is supported to full stage.

Applicants will be given brief feedback from the Panel summarising the reasons why the Outline was successful/unsuccessful. No further feedback will be available.

The assessment criteria to be used on Full Proposals will be as follows:

- The scientific excellence of the proposed research
 - Demonstrate the originality and quality of the proposed research, including the problem(s) it will address in relation to plastic packaging as appropriate for funding under the Enabling Research workstream, and how solutions will unlock existing barriers to fundamental systems change.
- Fit of the proposal to the SSPP Challenge Enabling Research aims and objectives (see Section 3.1):
 - Contribution towards delivering systemic changes that lead to the delivery of UK Plastics Pact targets
 - Potential to ensure outcomes are conceived to deliver sustainable environmental, societal and/or economic benefits.
 - How the proposed research fits with and complements UK research already funded in the area or related areas across the UKRI portfolio, and how the research requirement differs from other existing initiatives, funded by UKRI and more broadly.
 - How the proposed research complements institutional strengths and strategies and will add value to existing activities.
 - Evidence of potential to collaborate and/or co-design research with relevant actors from across the plastic packaging supply chain, including consumers, business and policy makers, where appropriate to the proposed research.
 - Potential to leverage match funding (financial or in-kind contributions) from project partners.

Given the very limited timeframe available to conduct the peer review, proposals will be assessed directly by an interview panel, involving a presentation. Full proposals will be sent out to external peer review by UK and international experts. There will be no written applicant response stage. The proposals along with the available reviews will be considered by an independent, interdisciplinary panel of experts who will also be allowed to review the proposals themselves (they will not just moderate the reviews). The applicant will receive the external reviewer comments to help prepare for the interview. The panel will be selected by UKRI to reflect the call remit and the need for interdisciplinarity.

The interview panel will make final funding recommendations to UKRI via a ranked list of the proposals. In making the final funding decision, UKRI will take into consideration the overall balance of the proposals across the plastic packaging supply chain. These decisions will be made in all cases in line with the overall call requirements and the available budget.

Applicants may be invited to give a presentation at the interview panel.

Feedback will be provided to both successful and unsuccessful applicants.

7 Timetable

Activity	Date
Outline proposal deadline	17 March 2020
Outline assessment panel	w/c 20 April 2020
Invitation to submit full proposals	w/c 27 April 2020
Full proposal submission deadline	30 June 2020
External peer review	July – mid-August 2020
Full proposal interview panel	w/c 28 September 2020
Funding decision communicated	w/c 5 October 2020
Grant start date	1 November 2020

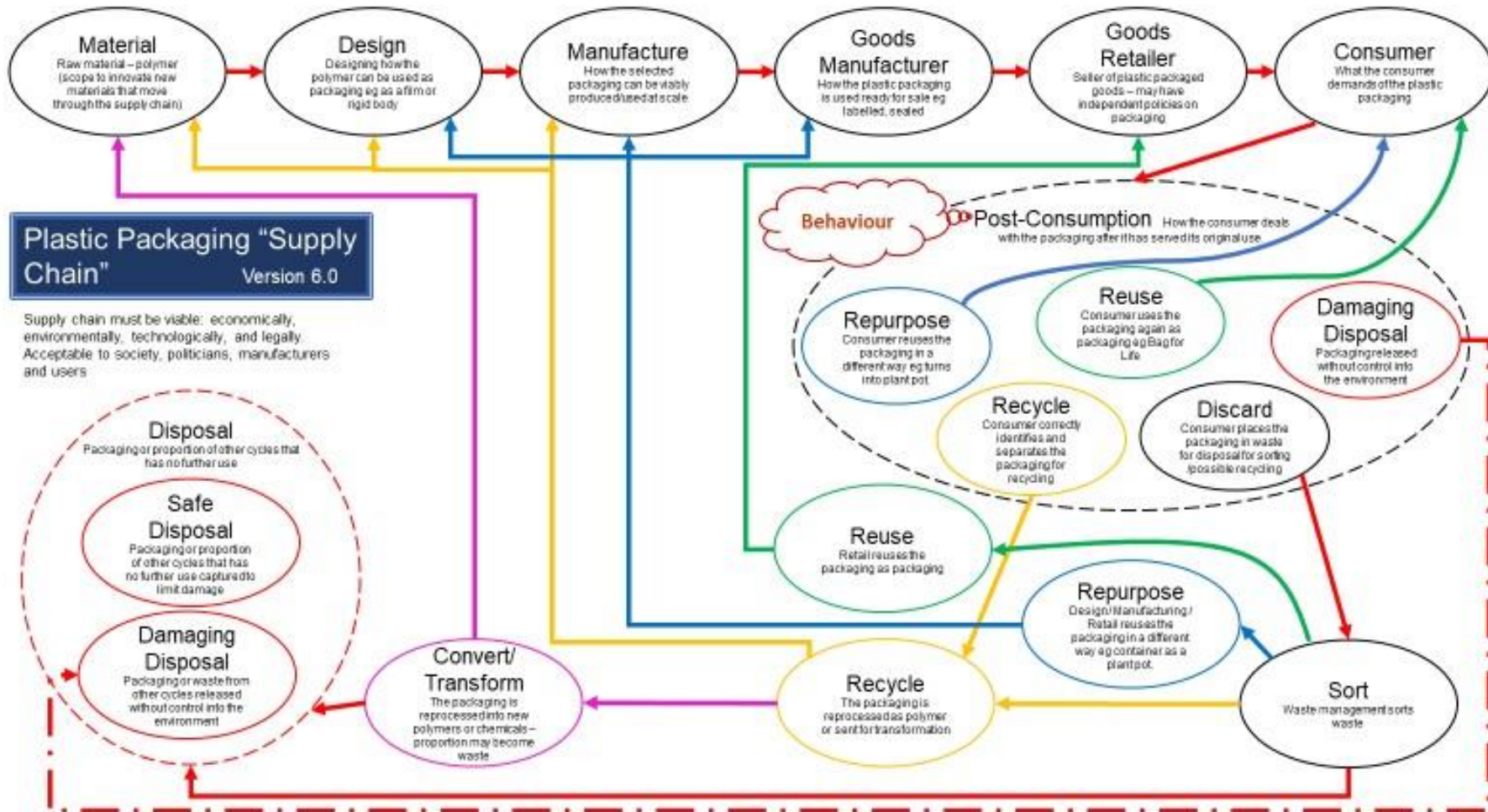
8 Contact

For all enquiries, please contact:

Sara Banning, Innovation Lead, Innovate UK, 07880 051539
plastics@nerc.ukri.org

Annex 1: Plastic Packaging Supply Chain

To aid understanding only – this is not a definitive diagram



Annex 2: Definitions of plastic and packaging

Definitions of plastic

Directive 2004/19/EC

Plastics are: 'organic macromolecular compounds obtained by polymerisation, polycondensation, polyaddition or any similar process from molecules with a lower molecular weight or by chemical alteration of natural macromolecular compounds.

Molecules with a lower molecular weight are defined as monomers that can combine with others to form macromolecular compounds known as polymers

Article 3(5) of Regulation EC 1907/2006

Polymer: means a substance consisting of molecules characterised by the sequence of one or more types of monomer units. Such molecules must be distributed over a range of molecular weights wherein differences in the molecular weight are primarily attributable to differences in the number of monomer units.

A polymer comprises the following: (a) a simple weight majority of molecules containing at least three monomer units which are covalently bound to at least one other monomer unit or other reactant; (b) less than a simple weight majority of molecules of the same molecular weight.

In the context of this definition:

- a 'monomer unit' means the reacted form of a monomer substance in a polymer;
- Monomer: means a substance which is capable of forming covalent bonds with a sequence of additional like or unlike molecules under the conditions of the relevant polymerforming reaction used for the particular process;

Article 3 of the draft EU Directive on Single-Use Plastics

(Also included in the UK Plastic Packaging Tax Consultation document)

'Plastic' means a material consisting of a polymer within the meaning of Article 3(5) of Regulation (EC) No 1907/2006, to which additives or other substances may have been added, and which can function as a main structural component of final products, with the exception of natural polymers that have not been chemically modified.

Definition of Packaging

UK Plastic Packaging Tax Consultation document

For the purposes of the [Plastic Packaging] tax, the government proposes that the definition of packaging would be based on definitions in the Producer Responsibility Obligations (Packaging Waste) Regulations 2007, and the underlying Packaging Waste Directive (94/62/EC).

Packaging is currently defined within the Packaging Producer Responsibility regulations as: all products made of any materials of any nature to be used for the containment, protection, handling, delivery and presentation of goods, from raw materials to processed goods, from the producer to the user or the consumer. Non-returnable items used for the same purposes shall also be considered to constitute packaging.

The following types of plastic packaging would therefore be within the scope of the tax:

- Primary, secondary and tertiary packaging as defined by the current Packaging Producer Responsibility regulations
- Re-usable plastic packaging, as currently defined by the Packaging Producer Responsibility regulations
- Consumer-facing packaging and distribution and transit packaging, as defined in the parallel consultation regarding the Packaging Producer Responsibility regulations, should these definitions be adopted in place of the primary, secondary and tertiary definitions

This definition also includes component parts such as labels or lids used to present or protect a product.

The government understands that at the point that plastic packaging is ready to be packed/filled it may be made up of different component parts, such as bottle tops and cup lids. These component parts may be supplied separately by different manufacturers using different processes, but they would individually be included in the definition as set out above.

Composite packaging

Materials used in the manufacture of packaging and includes raw material and processed materials prior to their conversion into packaging:

When composite packaging is categorised for the purpose of calculating Producer Responsibility obligations, the 2007 Regulations say that: packaging materials composed of a combination of any of those materials are to be treated as made of the material which is predominant by weight. For the purposes of the tax, the government intends to consider composite packaging that is predominantly plastic by weight as plastic packaging. Packaging made of multiple types of material, which is not predominantly plastic, will not be considered plastic packaging for the purpose of the proposed tax.

Smart Packaging

Smart packaging includes active and intelligent packaging.

- Active packaging is packaging that provides one additional function, in addition to its primary purpose of containment and protection — for example, moisture absorption or oxygen control through desiccants.
- Intelligent packaging is packaging that senses a change in the environment and communicates or signals this information to an interested party — a two-step process. Functions of intelligent packaging include counterfeit protection, supply chain management control, food safety, and marketing applications. Examples include ripeness indicators, time or temperature indicators, or NFC labels.

- Technologies include, but are not limited to:
 - Active Packaging
 - Gas Scavengers (Ethylene (Ethene) Scavengers, Oxygen Scavengers)
 - Corrosion Control
 - Moisture Control
 - Antimicrobial
 - Modified Atmosphere Packaging (MAP)
 - Intelligent Packaging (IP)
 - Tracking Devices
 - Indicators