Smart Sustainable Plastic Packaging
Final Process Evaluation Report

Prepared for UK Research and Innovation

Contents

1 Introduction

1.1 Background and research objectives

UK Research and Innovation (UKRI) commissioned Winning Moves to complete the second phase of a three-phase evaluation of the Smart Sustainable Plastics Packaging (SSPP) Challenge, one of 23 challenges funded through the Industrial Strategy Challenge Fund (ISCF). Building on Phase 1, which provided an evaluation framework and a set of project and challenge level baseline indicators, this phase is divided into two constituent parts, a Process Evaluation, and the collation of baseline performance indicators from successful and unsuccessful project applicants.

The purpose of this report, which presents findings of the Process Evaluation, is twofold:

1. To assess the effectiveness of key processes/mechanisms/approaches implemented to successfully deliver the SSPP Challenge:
    a. What has worked well or less well.
    b. What steps has SSPP already taken to adapt and improve certain processes or to change course.
    c. What further improvements could be made during the remainder of the challenge lifetime and for administration and delivery of future calls, like that published at the start of September 2022.
2. More specifically, evidence collated from SSPP Challenge staff and delivery organisations, project applicants, and wider stakeholders, has been used to answer four overarching Process Evaluation (PE) questions covering design, implementation, monitoring and value creation (wider impact). The PE questions are detailed in Table 1 below:

Table 1: Process Evaluation Questions

> **PE1: To what extent did the design of the SSPP Challenge, contribute to achieving the Objectives of the Challenge? What is working (has worked) well/less well and why?**

> **PE2: To what extent did the project delivery contribute to achieving Challenge objectives?**

> **PE3: To what extent have the SSPP Challenge internal monitoring processes and activities contributed to achieving the Objectives of the Challenge?**

> **PE4: Has the value created by the Challenge, as a whole, been greater than the sum of its parts? (Principally answered through engagement with projects)**

Source: Winning Moves revised Process Evaluation Questions originally taken from Evaluation Framework

Several sub-questions, detailed at the start of each section, have been considered to provide a structured and detailed answer to each of the four PE questions above.

1.2 Research approach

To collate the evidence needed to robustly answer the four process evaluation questions, we have completed semi-structured interviews with each of the following 'interested parties':

1.2.1 Challenge staff and delivery organisations

We completed a total of 13 interviews with UKRI, Innovate UK Knowledge Transfer Network (UKKTN) and Natural Environment Research Council (NERC) staff, who have been directly involved in the management, delivery and monitoring of the challenge. Including interviews with the SSPP Challenge Director, SSPP Deputy Challenge Director, Challenge Fund Director, Impact and Performance Manager, Finance Business Partner Project Manager, Innovation Leads and Monitoring Officers from the Challenge, these discussions asked about the goals, aims and objectives of SSPP, together with their perceptions of key processes implemented to design, deliver, manage, and monitor its activities and impacts.

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1.2.2   SSPP Challenge project applicants

We completed Tranche 1 semi-structured interviews with SSPP project applicants, where we spoke with 52 project leads and selected partners, who represented sixty-seven projects, broken down by workstream below:

Table 2: Number of semi-structured interviews completed by workstream and status.

Workstream	Successful	Unsuccessful	Ineligible	Withdrawn
Feasibility Studies for Demonstrators (FS4D)	3	3	0	1
Feasibility Studies & Industrial Research (FS&IR)	4	4	0	1
Future Plastic Packaging Solutions (FPPS)	5	4	0	2
Demonstrators Round 1	2	0	1	n/a
Demonstrators Round 2	3	4	1	n/a
Demonstrators Round 2 EOI	n/a	n/a	1	n/a
Enabling Research (ER)	8	3	0	n/a
Business Led Research and Development (BLR&D)	6	10	1	n/a
Total	**31**	**28**	**4**	**4**

1.2.3   Core Programme delivery organisations

An additional six projects were directly funded under Workstream 1: Core Programme (discussed in more detail in Section 2.2.2 below), with the aim of providing leadership and fostering collaboration. Delivered separately from the other workstreams, project managers for five of the six projects[1] were interviewed about the strategic fit of their projects with SSPP, their working relationships with UKRI (principally Innovation Leads and Challenge Management) and the development of collaborative links.

1.2.4   Wider stakeholders

We also interviewed four wider stakeholders[2] from the following organisations:

> Innovate UK
> WRAP
> The British Plastics Federation (BPF)
> Members of the SSPP Challenge Advisory Group (CAG).

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[1] There were 6 projects funded through the Core Programme. We were successful in securing interviews with Project Managers for 5 of them.

[2] We had also agreed to interview representatives from the Department for Business, Energy and Industrial Strategy (BEIS) and the Department for Environment, Food and Rural Affairs (Defra), but these could not be organised due to their organisational work commitments (outside their engagement with UKRI and SSPP).

The purpose of these interviews was to understand how the SSPP Challenge fits strategically with the objectives of other organisations working to reduce the use, and environmental impacts of single use and problematic plastics, and how its implementation and delivery has contributed, and will continue to contribute, to specific targets around the use of plastics.

In addition, with the help of Innovate UK KTN and WRAP, we have administered two surveys, which have been completed by Circular Plastics Network and Plastics Pact members respectively. These surveys have explored respondents' awareness and understanding of the SSPP Challenge and how its workstreams and activities align with wider issues relating to Plastics Packaging, and the Plastics sector more generally.

1.2.5   Report Structure

The remaining sections of this report are aligned with the four Process Evaluation Questions:

> Section 2: Design of SSPP and contribution to Challenge objectives.
> Section 3: Delivery of SSPP and contribution to Challenge objectives.
> Section 4: Internal monitoring processes and their contribution to achieving Challenge objectives.
> Section 5: Value creation and wider impact on Plastics Packaging.
> Section 6: Conclusions and recommendations.

Sections 2-5 detail and discuss the evidence collated for each of the four Process Evaluation questions. This evidence is then drawn together in the last section to provide UKRI with a set of conclusions and recommendations.

2 PE1: Design of the SSPP Challenge and contribution to Challenge objectives

This section focuses on the design of the SSPP challenge, specifically how the agreed aims and objectives of SSPP are relevant to, and will address, the issues and problems prevalent in the Plastics Packaging sector; and how decisions taken regarding the Challenge structure, funding and delivery processes have contributed to the ongoing achievement of those objectives. In answering questions PE1.1 – 1.3, evidence has principally come from interviews with Challenge staff, delivery organisations, and wider stakeholders. The sub-questions answered in this section are detailed in Table 3, below.

Table 3: PE1 Sub-questions

> PE1.1 Were the Goal, Vision, Aims and Objectives of the Challenge relevant to the problem that it sought to address?

> PE1.2 Were the three Challenge workstreams sufficiently aligned with each other and with the needs of industry and the nation?

> PE1.3 Was the structure of funding offered appropriate for delivering the Challenge objectives?

> PE1.4 Are there any processes that could or should be adapted or improved during the remainder of the challenge lifetime? *

Source: Winning Moves revised Process Evaluation Questions originally taken from Evaluation Framework

2.1   Relevance of SSPP to the problem/s that it sought to address

2.1.1   The role of Blue Planet 2 in raising awareness of plastics and their environmental impact

While it is overly simplistic to view the airing of Sir David Attenborough's Blue Planet 2, in the Autumn of 2017, as the sole catalyst behind the implementation of the SSPP Challenge, several Challenge staff and wider stakeholders, like many working in environmental sustainability and the Plastics sector, viewed the series as a watershed moment in raising public awareness of the role that single use plastics were playing in the destruction of the planet's marine environment:

'I take it right back to the Blue Planet 2 series, which really was a watershed moment for the plastics industry. The series hit the screens at the back end of 2017 and for the first time 'Joe Bloggs on the street' stood up and took notice about Plastics as an issue'.

'Of course, the public were aware of some of the environmental impacts of Plastics use, and how a lack of plastics recycling was leading to inappropriate disposal of single use plastics, into the oceans and into landfill. However, I don't think it was until Blue Planet 2 that people fully understood the issue and their role in being both the problem, but also the solution'.

There was widespread agreement too, that the series had entered the public consciousness and that this increased awareness and concern presented an opportunity to affect change, that could not be 'passed up'.

'Sir David Attenborough stands up, wows the nation, and highlights the big concern with plastic marine pollution. It is now in the public consciousness. The Government then takes notice and says that something needs to be done about plastics. When you then add COVID-19 and lockdown into the mix, there is now a huge focus on wider environmental issues and sustainability. The sort of 'Attenborough Effect' pushed plastics further up the common consciousness'.

In March 2018, UKRI received an initial £20m funding, which turned into the Plastics Research and Innovation Fund (PRIF). UKRI and partners were thinking about circular strategies for plastics and what Innovate UK, and the Engineering and Physical Sciences Research Council (EPSRC) should be spending its money on.

'It was out of this money that came an EPSRC funded programme of work, and Innovate UK programme of work and a joint venture with Sky Ocean Ventures'.

2.1.2 The overarching aim of SSPP

Established at the end of 2019, the SSPP Challenge is a £60m programme to be delivered over six years, to 2025/26, with approximately £150m of additional funds expected to be leveraged in cross-sector private investment. This requirement for significant amounts of private sector match funding, together with the Government's setting of ambitious targets, and policy and regulation proposals, was an important motivation behind the SSPP Challenge Team's decision to focus on funding large scale demonstrator projects, that were closer to market, a decision which shaped much of the design and outcomes of the Challenge that will be explored in greater detail later.

It was hoped that SSPP:

'...would drive research and innovation to develop more sustainable plastic packaging materials and new designs, new recycling processes and infrastructure, integrated circular supply chains, combined with consumer behaviour insights, to achieve a reduction in the negative environmental impacts caused by plastic packaging'.

While initiatives, including the UK Plastics Pact, Ellen MacArthur Foundation New Plastics Economy and Alliance to End Plastic Waste, all demonstrate a high level of industry interest in sustainable plastics, it was reported the SSPP Challenge was introduced to address a perceived lack of coordination at the 'whole system' level. This lack of coordination was evidenced by the implementation of piecemeal, short-term, and sub-optimal solutions to the issue of problematic plastics.

The overarching aim of the SSPP Challenge is to deliver positive, sustainable environmental benefits and be economically viable, compared with current systems, in both the short and long-term. Comprising three separate workstreams, the intention is for the SSPP Challenge to mobilise and coordinate collaboration amongst government, academia, and industry to deliver a more circular economy for plastic packaging. This will be achieved through delivering solutions such as:

> New, recyclable materials.
> New designs for consumer-friendly packaging, with improved functionality and sustainability.
> New or improved recycling technologies and processes to recover packaging after its use.
> New or improved supply chain and business models based on the above.
> Improved understanding of environmental impacts of existing and new plastics to inform the above; and
> Improved understanding of consumer requirements and behaviours to inform the above.

2.1.3 SSPP Challenge Objectives and their alignment with UK Plastics Pact targets

The SSPP Challenge objectives, which are detailed in Table 4 below, align closely with those of ISCF and the Resource and Waste Strategy and directly reference the targets contained in the UK Plastics Pact.

Table 4 SSPP Challenge Objectives

'To unlock a significant overall increase in R&I spend (toward UK target of 2.4% of GDP) on new forms of plastic packaging (designs, materials and technologies) with improved functionality and sustainability'. Target – £60M government investment matched by at least £149M of industry co-investment, with a leverage target of 1:3 for demonstrators.
'To deliver R&I to support more sustainable plastic packaging in line with the UK Plastic Pact targets'. Target – measurable progress towards achieving the UK Plastic Pact targets (100% reusable, recyclable, compostable, 70% effectively recycled or composted, eliminate problematic or unnecessary single-use, 30% average recycled content).
'To increase UK plastic packaging supply chain collaboration on improving sustainability'. Target – Minimum of 10 significant multi-stakeholder CR&D projects delivered.
'To increase understanding of environmental impacts of existing and new plastic packaging to inform new and improved design, technologies, and processes'. Target – Development of new/improved standards for plastic packaging e.g. recyclability, biodegradability, compostability.
'To increase understanding of behaviour on the sustainability of plastic packaging to inform new and improved design, technologies, processes and business models'. Target – UK Plastic Pact target 70% of plastic packaging effectively recycled or composted.
'SSPP innovation recognised internationally as a UK strength, and source of export growth and inward investment'. Target – an increase on the current baseline of export sales.

Source: Smart Sustainable Plastic Packaging ISC Wave 3 Business Case V3

The SSPP Challenge team took a conscious and deliberate decision to align the challenge objectives to Plastics Pact targets, relating to reuse, recycling, and reduction of plastics. When asked for their opinion on the decision to adopt the targets, there was widespread agreement for three main reasons.

Firstly, the UK Plastics Pact was the first initiative that had consulted with, and brought together, businesses from across the entire Plastics Value Chain, with the UK Government and Non-Governmental Organisations, to tackle plastic waste.

> *'It was not as if the decision to align with The Plastics Pact was simply an issue of convenience. We recognise that the targets were consulted on, and agreed by, the very types of organisations that the SSPP challenge is seeking to influence'.*

> *'SSPP is all about collaborative working and getting the different parts of the Plastics Packaging industry to work together to make change. The Plastics Pact are effectively a manifestation of this type of collaboration. If you want to get buy-in from producers, manufacturers, recyclers etc, then aligning with the Pact made sense. They all have a vested interest and a common goal, and anything aimed at delivering that will bring people to the table'.*

It was also noted that the UK Plastics Pact is the first within a network of pacts enabled through the Ellen MacArthur Foundation's New Plastics Economy initiative, which now includes a European and Indian Plastics Pact, with the SSPP Challenge instrumental in setting up the latter. Several Challenge Team staff felt that aligning the SSPP Challenge to an internationally recognised set of targets would make it easier for projects,

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and their impacts, to garner international acclaim and, in the longer-term, to establish international links and partnerships.

'Plastic packaging and the detrimental environmental impacts of plastics are not only a UK issue, it's global. To make a real change, we will need international collaboration, links to institutes and universities across the world. If we are all working towards the same aims and have the same understanding, then these links will be far easier to develop, and most importantly, to sustain'.

Secondly, many interview respondents stated that aligning with the Plastics Pact focused Challenge activities on key issues. They felt that the scope of SSPP remains broad and covers a diverse range of projects; but that there was a need to focus the funding on particular issues to maximise impact:

'You have got to make choices about the breadth of projects you fund, and over what period you expect pay-off. We wanted to look at things that were close to market and that could attract co-investment'.

'I mean, where do you draw the line, plastics is a huge problem and plastics packaging is a key contributor to that problem. We had to draw a line in the sand and say this is where we focus the money. We have a set amount of money so let's not try and be all things to all people, lets focus on a handful of issues where we can maximise impact'.

With its focus on re-use, recycling, and reduction, several of the SSPP Challenge Team thought the Plastics Pact targets provided the framework and boundaries for the scope of activity. In consciously deciding to target funding at a handful of big issues, the Team recognised there would be project ideas that could not be funded within the parameters of the current call. The Team was 'comfortable' with this but appreciated that some organisations and prospective projects may be 'frustrated' or 'disgruntled' that their project was not in scope.

The third benefit cited by the Challenge Team of aligning the SSPP Challenge with the Plastics Pact was to make a difference in the 'here and now':

'The Challenge is time bound. In aligning the challenge to the Plastics Pact, we have to deliver impacts and real change by 2025. There is still a nod to the future, but this challenge is about the here and now and making a difference in the here and now'.

'We can't keep pushing this issue down the river, we need to start making a difference and we need to show that the funding we have spent is doing something. Also, if we want private sector engagement, businesses will want to see a return on their investment. The Plastics Pact establishes a deadline on projects to deliver and this is what businesses want to see'.

2.2 PE1.2: Alignment of challenge workstreams with each other and with the needs of industry

Having considered evidence and interview responses relating to the aims, objectives, and goals of the SSPP Challenge, and their relevance to the 'plastics problem', this second question considers that relating to the decision to structure the challenge into distinct but inter-related workstreams. Specifically, whether this decision has allowed the Challenge to work as a *'coherent and connected entity'* while also ensuring that the needs of industry and the wider nation are met.

SSPP funding was organised into three workstreams, and 7 different competitions. Each competition, including a brief description and allocated funding,[3] are detailed in Table 5, below:

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[3] *'Smart Sustainable Plastic Packaging Challenge Evaluation: Final Evaluation Framework Report'*. Eunomia, 11th March 2021.

Table 5: SSPP competitions and grant funding allocations[4]

Workstream	Total funding
Feasibility Studies for Demonstrators (FS4D)	£209,011
Feasibility Studies & Industrial Research (FS&IR)	£175,280
Future Plastic Packaging Solutions (FPPS)	£1,739,971
Demonstrators Round 1	£9,506,826
Demonstrators Round 2	£20, 298, 604
Enabling Research (ER)	£8,511,970
Business Led Research and Development (BLR&D)	£7,814,803
Total	**£50,023,624**

Source: Delphi report January 2023, showing money awarded

2.2.1   Workstreams reflect the commercialisation process

Several project applicants and wider stakeholders, particularly applicants who had received funding for multiple projects under different workstreams, stated that the workstream structure broadly mirrored the commercialisation process that new products and services follow. According to the University of York[5]:

> *'Commercialisation is the process of turning an idea into commercial products or services. This means commercially developing Intellectual Property (IP) that has been created through research, with the goal of creating successful commercial outcomes which have a positive impact on wider society. This is typically achieved through the commercial licensing of intellectual property to an existing commercial organisation or the formation of new spin-out company to take the new products or services to market'.*

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[5] 'Commercialisation process', https://www.york.ac.uk/staff/research/commercialising-research/commercialisation-process/

Workstream	Description
Research	Funded projects at National laboratories and universities make a scientific discovery with potential commercial value
Disclosure and IP protection	Universities inform laboratories' technology transfer office about an idea or invention
Licensing	Once patenting process has begun, interested companies can license products/inventions
Testing and validation	A new prototype is developed and tested. Commercial value of the product/process or service is confirmed
Product development	The tested prototype is turned into a commercial product
Manufacture and deployment	The new product is mass produced, brought to the market, and sold

'The workstreams are part of a journey. Both theoretically, and in practice, projects have received funding under one workstream in a previous call and then successfully applied again for funding under a more 'advanced workstream'. This shows the direct links between the workstreams and highlights how a concept or idea can move closer to market'.

There are a few projects, originally funded under the two feasibility study workstreams FS&IR and FS4D, that progressed on to Business Led Research and Development (BLR&D) and Demonstrators Round 2, in the current funding call. A short summary of one such example, Stopford Projects Limited, is detailed in Box 1 below:

Box 1: Examples of feasibility studies progressing on to R&D and Demonstrators

Stopford Projects Limited are developing a chemical recycling process, which uses high pressure and high temperature water to break apart polymer chains in plastics and convert them into naptha, which can then be used to make fresh plastics. The project is focused on solving the issue of problematic plastics, such as laminates and mixed plastics, and converting those into an end product which can be used to generate fresh plastics. The project will hopefully drive recyclability, the recycled content of packaging and decarbonise the production of fresh plastics.

'The programme (SSPP Challenge) has accelerated the development of our technology from technology readiness level 2, which is an early conceptual stage, up to technology readiness level 5, where it has been industrially validated'

As part of the award, the project has built a consortium of organisations, including technical academics and industrial partners, with Stopford as the interface between the two. Now in BLR&D, current progress involves developing a financial model, an IP portfolio and regulatory considerations, alongside the technical information needed to secure further investment.

Sources: SSPP Project Interview and video presentation available on the SSPP web page

In another example of project progression, we also identified several organisations that had previously received funding under the Plastics Research and Innovation Fund (PRIF), that had related projects or the next stage of their projects, funded through FPPS. These include projects led by Notpla, who received PRIF funding (under a different company name) to develop an alternative packaging material for sauce packets and extended this concept to plastic wrap replacements in the Cosmetics industry. Notpla also went on to receive funding under FS4D and FPPS. Cauli Limited, received PRIF and is now using SSPP funding to develop a digitally enabled reusable lunchbox scheme to address the 'food to go' single use plastic packaging challenge. Dsposal is a third example, this time of a project partner, receiving funding from PRIF and then from FPPS.

As will be discussed in greater detail under PE1.3, the SSPP Challenge has intentionally funded a mix of organisations and projects whose products, technologies or processes are at different stages of development, including several that are closer to market and are, therefore, more likely to attract investment from the private sector and meet industry need. As one wider stakeholder commented:

> *'We originally sought somewhere in the region of £150m to fund the SSPP Challenge and were able to secure £60m. To have the impact we wanted, we had to get match funding or co-investment from big players in the Plastics sector. To do that, there had to be a commercial value and an economic benefit to them becoming involved and that benefit is most easily realised if a new polymer, recycling process or technology can be rapidly scaled up and put on the market'*

In funding several projects that are closer to market, the SSPP Challenge has successfully been able to establish collaborative partnerships with high profile companies, including recognised retail brands and larger plastics producers and manufacturers, organisations that have previously been *'conspicuous by their absence'*, in previous challenges. Retail brands have been particularly interested in supporting behavioural projects aimed at understanding and changing the behaviours of consumers and other organisations in the Plastic Packaging supply chain:

> *'We have seen engagement from 2 or 3 large retailers/supermarkets who have shown real interest in the consumer data we are collecting through our project. If they can understand what consumers want and how they are behaving, then they can begin to adapt their products to meet changing needs and expectations'.*

2.2.2 Core programme addressing barriers currently preventing supply chain collaboration

Alongside projects allocated funding through the competition process, the SSPP Challenge has also funded six projects under the 'Core Programme'. These projects are hoping to remove longstanding barriers that are currently preventing the Plastics Packaging supply chain from working collaboratively to address single-use and problematic plastics. Several wider stakeholders and project leads stated that the Core Programme's focus on developing new standards for collaborative relationships and testing the suitability of new polymers for food contact, together with an emphasis on educating the supply chain, showed an up to date and detailed understanding of the problems and barriers currently facing the plastics packaging industry, together with a clear vision for what was needed to address them:

> *'So, there were no formal standards for how collaborative relationships should be established. There might have been very relevant standards, but not with this specific scope. At the very start, our conversation with UKRI focused on what was needed to make collaboration easier and reduce confusion for the industry. One of the main reasons for developing a standard, for writing a new standard, is for ease of doing good. It is to make life easier for businesses and institutions. UKRI recognised this'.*

> *'If you want to make food contact material from recycled plastic, you basically have to show it is safe. That requires an established recycling process and an established set of testing criteria that you have to go through to show that your process cleans and decontaminates material'. These only exist for PET, meaning that companies are basically interpreting these and doing this independently from one another'.*

However, in taking a different and more collaborative approach to designing and implementing these projects, it is clear from interview responses the SSPP Challenge Team also felt that, while these projects were 'undoubtedly' needed, the private sector was unlikely to show much interest in competitively tendering for them, or investing financially in them:

> *'The Core Programme is very much about identifying gaps in the project portfolio that are unlikely to be supported or funded by the private sector. These projects are needed if the supply chain is to function effectively and address the issues outlined in the SSPP business case, but they are not what I would call 'sexy' projects'.*

In most cases, therefore, SSPP directly approached organisations that they perceived had the expertise, track record and reputation to successfully deliver against their requirements. According to project leads, the SSPP Challenge Team always had a clear vision for what they wanted the projects to achieve, and have been actively involved in shaping their design and implementation, whilst also taking a step back to allow their team to deal with the practical, technical, and legislative elements:

'SSPP were leading the discussions, showing a real understanding of industry needs and actively contributing to the development of the project. The individuals involved had relevant knowledge and expertise in the area and were well placed to support us during the developmental stages'.

'It is a two-way dialogue, definitely. UKRI have always been very clear about what they want the outcomes of the project to be but have always leant on us to deal with the practicalities. We know the process for developing new [protocol] and they have let us get on with It'.

As one wider stakeholder also put it:

'The Core Programme, and the projects being delivered under it, are addressing several industry barriers and, in doing so, are putting in place a framework on which the supply chain can more effectively work together in the future'.

2.3 PE1.3: Appropriateness of funding structure for delivering Challenge objectives

In answering this sub-question, the evidence focuses on two issues; where the funding was targeted, and the funding mechanism, including the significance placed on match funding from the private sector.

2.3.1 A focus on large-scale demonstrators

'For the SSPP Challenge to contribute meaningfully to the Plastics Pact targets by 2025, we needed to fund projects that were at a scale that would move the dial. We needed to fund projects that would encourage the private sector to invest and that would deliver significant and measurable change that would justify our decisions'.

To maximise private sector investment and to try and ensure significant contributions to the achievement of Plastics Pact targets, the SSPP Challenge directed funding purposefully at a smaller number of large-scale demonstrators, a move that many Challenge Team staff and wider stakeholders supported:

'I completely understand the rationale for giving large amounts of funding to the demonstrator projects. We are spending public money and spending it at a time of huge economic uncertainty, during and following COVID. We need to show bang for our buck and evidence value for money. Larger projects, where industry has also been expected to contribute match funding, are more likely to deliver the level of change we need'.

'I think SSPP has got the balance right. We have a good mix of larger projects that will deliver new facilities, and scale up the use of new technologies, new processes, and new polymers.'

2.3.2 De-risking investment in research and innovation and 'proof of concept' activities

There was widespread support for the Challenge Team's decision to support projects of different scales, including funding smaller scale, research and development projects, under Enabling Research and feasibility studies. These workstreams are funding projects aimed at identifying new technologies and polymers, and sustainable solutions for increasing recycling and re-use and reducing the production of problematic, single-use plastics.

'We also have projects at the other end of the spectrum; academic research projects that are looking at innovative new technologies and new polymers. These projects are looking to the future, beyond 2025, to innovations that will impact the packaging industry in 10 to 15 years' time'.

Their inclusion in the SSPP project portfolio recognises the inherent risks associated with funding such experimental and 'proof of concept' activities and the reluctance of academic institutions and the private sector to 'fully' fund them.

'Yeah. There is a lot more risk doing it commercially because it's obviously quite a new area and quite a new technology for us looking at barrier performance. So, if you do that with one customer and it doesn't work that then makes that customer think it doesn't work at all. When actually it's just No. It takes a bit of development and you're trying to do something new and develop a new product. It does take some R&D, but a lot of our customers just expect that we do have a solution and can provide that to them'.

'We are a small-scale organisation. We would love to fund all our R&D activity using our own money, but it is just too risky for us. You need to encourage academics and others to pursue riskier ideas and concepts otherwise there

is no innovation. But you cannot expect them to shoulder all of that financial and resource risk. For us, SSPP funding has allowed the continuation of our research and that might well lead to a new [product] down the line.'

2.3.3 A heightened focus on behavioural change

The SSPP Challenge team, and several wider stakeholders are pleased to see behavioural change projects funded and cited two reasons why their inclusion is important. Firstly, the future production, use and re-use of plastics and plastic alternatives, will be largely dependent on how attitudes and behaviours within the supply chain, and among consumers, change.

'We are already seeing a significant change in how consumers view the manufacture, use and disposal of plastics. This change, which, for me, is characterised by greater concern for the environment and higher levels of recycling and re-use is starting to have an impact on supply chain behaviours. Producers and big retail brands are starting to listen, but we need to do more to encourage a bigger change in what they are doing'

'All the projects that SSPP are funding will impact our relationship with plastics. Indeed, much of their success will depend on whether the industry and the public agree with them, support them, and start engaging with them. It was absolutely right that SSPP set aside funding for behavioural change projects and more of this type of research, and public engagement needs to happen if further changes and developments are to be made'

Secondly, with attitudes towards plastics changing, there was widespread agreement, among interview respondents, that more behavioural research to understand how these changes might affect the plastics supply chain. Other industries have recognised the importance of behavioural science in shaping product and service decisions, however, use of behavioural science in the plastics sector is not as advanced:

'Now, one of the difficulties we know here is that requires a degree behavioural change and I don't think it's as well developed as the other areas. The only thing we know about behavioural change in resource efficiencies, everything we've tried so far has failed, so I can't actually put your finger on what works'.

Returning to the earlier mention of engagement from producers and retail brands, several behavioural change project leads have seen academics, retailers and plastics manufacturers show a real interest in their research findings, and that this interest has more than justified the funding of behavioural projects under the SSPP Challenge:

'This is a [consumer focused project]. But additionally, we have the supply chain stage where we were trying to understand supply chain perspectives on the consumer attitude behaviour gap. So, we're trying to work with retailers and multi-tier supply chain actors to see how they understand it and their discourses around it and what evidence they have drawn on to make their conclusions about what consumers are doing and why they are doing it'.

'Academic audiences really want to know about what we've done. We've had a lot of approaches for a guest speaker slot at conferences and seminars, that kind of thing. They really want to know about it and they're really keen to get concrete consumer findings because they don't tally with necessarily, you know, our commercial partners might be thinking about consumers'.

2.4 PE1.4 Processes that could be adapted or improved for future SSPP calls and other ISCF Challenges

This section considers interviewees' perceptions of several key processes in the SSPP Challenge and shares their views on how they could be adapted and improved for future SSPP calls, and other ISCF Challenges.

2.4.1 Raising awareness of SSPP

Innovate UK KTN, (including the UK Circular Plastics Network (UKCPN)), NERC, other research councils and WRAP, have all played an important role in marketing, promoting, and raising awareness of the SSPP Challenge. Having set an objective of attracting interest from organisations across the plastics packaging supply chain, the SSPP Challenge combined the use of well-established networks and membership organisations, with other mechanisms, to raise awareness.

Using existing networks and membership bodies

In speaking with projects across all SSPP workstreams, it was clear that most of them had pre-existing relationships with UKRI and were members of UKCPN or the UK Plastics Pact. Many of them had also submitted previous funding bids to earlier SSPP calls and other Innovate UK funding streams. This meant they received regular emails, newsletters, and updates, which included information about future challenges and upcoming funding calls:

> *'I remember becoming aware of the challenge through Innovate UK. It was a case of knowing that they existed and that there would be some funds relevant to us. This opportunity came up around the time of the pandemic hitting, and forcing us inside, and it felt like a good opportunity to apply'.*

> *'I expect that I found out through my membership of UKCPN or that XXX spoke to me directly about it'.*

> *'As an organisation, we have been involved with Innovate UK projects since they were the Technology Strategy Board, and we have received quite a few grants. We have a good relationship with them, we know the people and we stay in regular contact'.*

While many agreed that using existing networks proved to be a highly effective mechanism for attracting applicants, some Challenge Staff and project leads felt that it had led to the *'same old organisations applying'* and limited engagement from smaller, newer, and potentially more innovative companies:

> *'If you weren't part of KTN or UKCPN then I am not sure how you would have found out about the Challenge. There is the risk that, in limiting our promotional activities to those membership bodies, we have missed attracting interest from newer organisations, business start-ups and individuals with a novel and more innovative approach to tackling plastic packaging'.*

In debating the use of existing networks, there was some suggestion, particularly among unsuccessful projects, that the decision to allocate significant levels of funding to larger-scale demonstrators, may have led to an intentional selection bias, with UKRI more inclined to fund organisations they have a pre-existing relationship with, that have a proven track record in delivering successful projects and that can be trusted to deliver required or expected outcomes.

> *'While we don't want to be entirely risk averse, we need to have confidence that the organisations and projects supported can deliver against their intended outcomes and can maximise the impacts from the funding awarded. If we fund too many organisations that we know nothing about, we are increasing our organisational risk and the likelihood of strategically important projects failing. I am not sure this would sit comfortably with our board'.*

However, many felt any perceived selection bias was more than understandable given the level of funding awarded to projects, and the need for them to succeed and contribute to the Plastics Pact.

> *'It is human nature that you reduce the risk of failure wherever possible. The Challenge is already taking risks on some of the projects within its portfolio, and there is a need to balance this with projects more likely to deliver change. If you are spending lots of money, you want to know it will be in safe hands and be used effectively'.*

Limited success with trade publications

In recognising the limitations of existing networks and membership organisations in reaching a new audience, and attracting applications from previously unfamiliar organisations and partnerships, the SSPP Challenge used advertisements and articles in selected trade publications. Formal (paid for) advertisements were placed in Packaging News, The Grocer and on the British Plastic Federation (BPF) website for Demonstrator Round 2 and Business-led Research & Development (BLR&D):

> *'For example, while we'll have our list of targeted press which we know will hit some of those key people, we'll also target articles in The Manufacturer or The Chemical Engineer - publications that are slightly outside the box but would still fit the criteria of the competition. That's probably the best way we can reach those audiences outside the IUK circle because we can easily publicise things through the Innovate newsletters and the social media.'*

However, none of the projects we interviewed made any reference to hearing about the project via this media. The SSPP Challenge Team may wish to review this further as part of the final evaluation to determine more accurately the contribution that advertising in trade publications may have had on the applicant profile and profile of applications received.

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Launch events – striking the right balance between administrative necessity and subject matter discussion

As the above title suggests, competition launch events, workshops and marketing and promotional materials must strike a delicate balance between delivery of subject specific information and detail on administrative processes, including eligibility criteria and application submission requirements. Based on discussions with the SSPP Challenge Team, most felt that an appropriate balance had been found:

> *'I mean they will stand up and be inspiring and go wow, we're going to change this industry! It's really lovely, then someone will stand up and read out T&Cs for half an hour - somebody technical and very knowledgeable'.*

Despite this, there was recognition that the more administrative elements of the events were somewhat dry, *'a little boring'* and may have put individuals off attending similar events, which will have provided important and tailored information for each of the workstreams.

In discussing the launch events with project applicants, a clear distinction can be made between the views of first time/inexperienced applicants and smaller organisations and those larger organisations, including universities and other academic institutions, that have submitted previous Challenge applications and received funding from Innovate UK/UKRI. For new, inexperienced, and smaller organisations, the administrative content of the launch events was invaluable and provided important background information on eligibility and the application process. Several mentioned that they would have been unlikely to apply had they not attended:

> *'There was a video, webinar by the KTN, I believe, which was very comprehensive and talked through how to apply for funding, or to give you tips, on how to approach the application, what was needed, the process, typical mistakes that have been made previously…and so that was hugely helpful. As someone who was relatively new to all this, I am not sure I would have been comfortable attempting to draft an application without this information'.*

However, more experienced applicants, who had submitted previous funding applications, were a little more dismissive of the events and the information they provide:

> *'They are not normally very useful, you just turn up and it is kind of the same thing. They tell you what a good application looks like etc but there isn't anything there you couldn't just read on the website anyway'.*

Some project leads suggested having more tailored and 'information specific' events and presentations for newer, more inexperienced organisations.

> *'If you are an experienced bid writer and have previous experience of submitting applications with UKRI, and specifically for SSPP, I can see why you may not want to attend the events as they provide a lot of information that you already know. For us, they were vital in helping us understand requirements, expectations and process. I think there is probably benefit from having more tailored events depending on previous experience and understanding. Another way to further increase attendance could be to include information that applicants can only receive at the events, although I appreciate this may disadvantage individuals and organisations that are unable to attend'.*

2.4.2 SSPP application process

Although the SSPP Challenge Team adapted aspects of the application process, including additional environmental and financial assessments for the larger scale Demonstrator projects, the overall process would have appeared very familiar to experienced UKRI Challenge applicants and individuals/organisations with experience of bidding for public research grants and other funding.

> *'The innovate process is really well known to us. We are familiar with it, writing grants. We have a really high success rate. I don't think there were any particular surprises when it came to the SSPP challenge. I think it was fairly straight forward.*

Based on discussions with the SSPP Challenge Team and applicants, the application process varied depending on the workstream. Enabling Research (ER) and Demonstrators Round 2 used a two-stage application process, which comprised a shorter application, effectively an Expression of Interest, success at which would move the applicant onto the full application stage. This stage requested more detailed information about the proposed project and, as referenced above, additional financial information and consideration of environmental impacts. Interviews were also conducted with these projects, which included a presentation and a question-and-answer session, and which was often attended by the SSPP Challenge Director. Projects under all other workstreams submitted a single application.

Mixed views on the structure, content and level of information requested for Stage 1 and Stage 2 applications

While most applicants supported the premise of having a two-stage written application process, and the role the stage 1 application plays in 'whittling down' numbers or as one applicant put it *'separating the wheat from the chaff'*, it was also felt that the two application stages were too similar and requested too much information, including information that may not be readily available at that stage of project development.

> *'As I remember it, the stage 1 application was almost as long and as detailed as the full application. It also felt as if there was a fair amount of repetition between the two and what felt like requests for the same type of information several places in the application'.*

> *'The two-stage application process makes sense and is pretty common, but the stage 1 application, for me, was too detailed. If it was just about obtaining initial, background information about the project, its purpose, and outcomes etc, then it was too long. As a team, we also felt we were being asked for too much detail, at what is still a developmental stage in the project'.*

The issue of what type and level of information to request in written applications was debated among project applicants. Many applicants, particularly those who submitted a successful application, understood the rationale for requesting more detailed information, and were happy, wherever possible, to submit a business plan and financial costs breakdowns:

> *'Innovate's process is quite lengthy and quite involved, I can see why because effectively they want to ensure that you're effectively producing a business plan so there is a requirement to actually ensure there's a clear route to market as well as the innovation'.*

There were also applicants that praised the structure and content of the application, and the clarity that UKRI provided on their requirements and expectations:

> *'The Innovate UK application is incredibly robust, incredibly specific. there are some really great things about them compared to other funders. I like the fact that they are really clear on what they are looking for, they are clear on what points need to be answered in the question, it was written by people who are clearly skilled, so you don't get questions that are not important or relevant. There is a good amount of time and wordcount to answer the questions'.*

For some, however, the issue of repetition, introduced in the quote above, was a frustration, with several struggling to identify the nuances between questions and the information needed to correctly answer them:

> *'There are some questions that repeat themselves, the answer might be more or less the same to two or three questions, which is difficult sometimes to deal with, as you want to answer differently to each question. I guess this is the same in every application process. it is about finding the right way to explain everything'.*

> *'There is quite a bit of repetition in that, you have a couple of questions in the beginning like 'What impact would the injection of public funding have on the business involved? How will you manage the project effectively, what impact will this project have outside of the project team'. These to me are superfluous questions and ask things that covered in other sections of the application'.*

Application process resource intensive and 'geared up' for larger and more experienced organisations

While the content and structure of the application was a debateable topic among project applicants, there was almost universal agreement that the application forms, and the whole process, were resource intensive, too time consuming, and in many people's eyes, geared too heavily towards larger organisations, who have more staff, more experience in submitting funding applications, and repositories of information that can be amended quickly for common questions.

> *'But yes, it is quite time consuming especially given the success rate might be relatively low. The time required to pull all the material together, especially if it's a new innovation and you've got a relatively short window to respond. It's an awful lot of commitment to developing the market data'.*

> *'Oh yes, the application process is useful, but I must say really I don't think this funding is set up for small charities like myself, so I was lucky enough to have enough time to have to go. I was lucky enough to find somebody who'd been successful with a similar application and the charity paid her to work on the application because she said to me, I know the terms they like. I know the phrases; I know the layout'.*

These two quotes were from a charity and a new start-up, whose applications were both unsuccessful, but they highlight difficulties that smaller organisations face when deciding whether to apply. For these companies, many of which will have new technologies and concepts that are more that suitable for Challenge applications, the time and financial resource needed to complete the process can also be prohibitive:

'It took quite a few weeks for us to find out that we had ultimately been unsuccessful in our bid. As a business we operate a lot quicker, our size makes us more agile but also means we need faster decisions. Our business models and operating structures are based on far quicker decisions, we lose money and time while we wait the outcomes of these bids'.

The issue of resource intensiveness was not only a concern for smaller organisations, with many larger and more experienced applicants also viewing the process as burdensome:

'The issue is the resource burden applications like this place on organisations of our size. For my team to help with drafting any application, they have to be taken off their day-to-day activities. This impacts our productivity and delays live projects, in favour of something we might not even be successful with. This application took a long time and, when compared with other applications we have submitted, too much time'.

Applicants found word limits challenging

Word limits in the application process were reported by some respondents as too restrictive, with people struggling to provide, what they considered to be, sufficient detail in response to certain questions. For some, this issue was exacerbated following a review of assessor comments, where they had been marked down for not providing enough information.

'The word limitation can be challenging, the questions are very detailed, sometimes you are asked to reply to 5-6 points in 400 words, it is hard to reply to everything with this limit. At the same time, it helped not spending three days replying to the same question because you know you are limited',

'One of the biggest problems I had was reducing the amount of words, I read the questions and put my answers together, then realized I had twice as many words that I could fit in the application. My main challenge was to reduce the content without reducing the impact'.

'I have it [an issue] more with the depths of the questions and the amount of space available to answer them. They don't have any resemblance of reality, particularly when I compare this application with others that I have submitted'.

As with the earlier discussion about environmental impact, word limits have the intended consequence of encouraging the applicant to be more concise and to consider the structure and content of their answer more carefully. As one academic identified:

'As academics, we do like the sound of our own voice and tend to waffle a bit. While the word counts are undoubtedly challenging for some questions, it does make you think and get you to be clearer and more to the point with your response'.

The role of the application in 'formulating and crystallising' your idea or concept

As introduced in the last quote, for many, the application process has provided a real opportunity to carefully consider their projects and crystallise what it is their project is seeking to achieve, and what outputs, outcomes and impacts they might be expecting to deliver. As one applicant put it:

'This is an application process. You cannot possibly have all the answers and absolute clarity when you set out on this process. That is why there are multiple stages. In my view, an effective process allows the applicant to build on the last and provide more and more detail as they go'.

This description of what is *'ostensibly an iterative process',* shows the value that applicants have placed on going through, and completing, the various stages. Even where applicants were ultimately unsuccessful in their application, many indicated they had found the process positive and had come away from it with a far clearer picture of their project, a position that many have used to submit higher quality and successful applications in subsequent funding calls:

'It is incredibly time intensive, which is not a bad thing as you must really want to do it. The reason I always prioritise Innovate UK applications is that whether or not you come out with a win at the end, you definitely come out with a really clear idea of what you project is and what your aim is'.

'When you do the application, you need to fully explain the scope which is also useful because you think further into what is involved, the outputs for us as a company, the different stakeholders. So doing further research and talking to a few more people is good'.

Interview a 'valuable' element of the application process

In an extension to the last point about formulating and crystallising project concepts, outcomes and potential impacts, project applicants were universally positive about the value of having the interview process. Several of the perceived benefits are summarised below:

> The interview offers an opportunity to provide more information and build on the written submission:

> *'Yes, there was an interview process. It was maybe no more than half an hour from memory where it was a presentation on the technology, what the project is all about, I think a lot of it was a translation from the first project to the second. And then quite in-depth, involved questions from the panel spanning across the SSPP leads. Both the presentation and Q&A provided the scope for us to give more detail about the project, while also clarifying concerns or issues that the Challenge Director, Innovation Lead or wider Challenge team, might have'.*

> *'And I know that for it, they did a lot of preparation, and they did a lot of mock preparation or mock interviews or panels up in [city] to try and replicate. The mock, the internal versions were much tougher than the actual interview'.*

> Applicants can meet the SSPP Challenge Team, including the likely innovation lead and Challenge Director, individuals who they might only meet during project monitoring and, potentially not at all:

> *'Great, very simple, probably it was a one-hour meeting with different people. We did our presentation; we had some interesting questions from different people. It was clear, simple, and straightforward. We got to meet their team and identify what each individual was most interested in or concerned about'.*

> Applicants viewed the interview as an opportunity to appraise the SSPP Challenge team, including their level of interest in, and understanding of, their project:

> *'I think people can be mistaken into thinking that the interview process is just about testing them. It can be so nerve wracking that people forget that this is also your opportunity to appraise them, can you work with them, do they grasp your project, are they excited and interested in it or are they more detached from it'.*

2.4.3 Support from Innovate UK KTN and Innovation Leads

Many of the SSPP Challenge team were keen to stress the importance of support offered via UK KTN staff and Innovation Leads, and the impact this support had on the likely success of submitted applications. Indeed, it was reported that the Challenge bought in additional resource to allow provision of expert advice and support to be offered to applicants and prospective applicants:

> *'We effectively bought additional KTN time to give companies greater access to KTN to ask those questions and give them the additional support they might need.'*

Several members of the SSPP Challenge team went on to state that applicants really benefited from this additional resource, using it to develop project concepts and ideas, as well as help them more effectively navigate the application process:

> *'KTN, in particular, have used the application process to help people think about their projects in a more structured way. They might have had a bright idea but XXX and XXX at KTN have helped them to refine it while completing the application process.'*

Through our engagement with applicants, both successful and unsuccessful, we have obtained a more comprehensive view of the support provided, its effectiveness and its overall impact. Before summarising these views, it is important to make a distinction between different categories or levels of engagement, ranging from those applicants that actively sought support with the application process or identification of possible partnerships and public/private sector collaboration, through to those who did not wish to access support

offered or were simply unaware of its existence. Across all these categories, perceptions of Innovate UK KTN, and their role, varied significantly.

Support for those applicants who actively requested it

Among applicants that actively sought support from Innovate UK KTN and/or the innovation leads, their views were broadly positive, with several benefiting from open dialogue with UK KTN, which allowed for iterative development of application, involving multiple rounds of drafting, reviewing, and amending:

> *'It is an iterative editing process, we get it done, they go over it and give their views because of their experience in bidding and their in-depth knowledge of the process and its requirements. XXX [from Innovate UK KTN] held our hand all the way through the process and was very supportive, he can't make the decision as he is completely independent, but he was a very useful resource and if we went through it again we would use him again'.*

> *'We would draft sections of the application and then share that with the team at KTN. They were careful not to spoon feed us the information and give us an unfair advantage over the competition, but their advice was invaluable in strengthening our bid and confirming that we were on the right track. When you have limited time, there is nothing worse that writing multiple responses only to find you were way off the mark. Sharing early iterations of the application ensured this didn't happen'.*

Several applicants, who were successful in the Enabling Research workstream, made a distinction between technical and scientific knowledge and support with drafting. Where Innovation Leads and Innovate UK KTN staff had knowledge of the more technical aspects of an application, they were happy to offer advice, and this advice was well received. Where they lacked this technical knowledge, they recognised this and focused their advice on how applicants might frame their response, and ensure it could be adequately understood:

> *'No, with the more technical stuff we had the teams at XXX and XXX universities, so we took this and put an industrial spin on it. But I don't think we had any assistance from UKRI or Innovate UK on the technical side. Where they were useful was on simplifying our language and explanations, so people with a lay person's knowledge would still be able to understand'.*

In reviewing applications as part of our interview preparations, there were some applications where careful consideration had been given to the reader. Technical terms were explained, use of acronyms were kept to a minimum and it was far easier to understand the rationale and purpose of the project. There were other applications, often written by academic institutions and universities, that were difficult to understand and where our interview questions and probes were important in confirming our understanding.

Projects not always receiving timely advice from UK KTN and/or Innovate Edge

While there was widespread praise and gratitude, from applicants, for the 'formal' support received from Innovate UK KTN, Innovate Edge and various innovation leads, there were, as would be expected, examples of applicants not receiving timely/responsive advice and support, with some sending several emails, and making multiple calls, before a response was received:

> *'There was one frustration really in that the Knowledge Transfer Network, during the initial video, did talk at great lengths about getting in touch, the most important thing you can do is get in touch and we will look at your application, give you feedback and we can run over it 2 or 3 times, but the most important thing is to get in touch as soon as possible, because everyone gets in touch with us in the last couple of weeks. We immediately got in touch with the Knowledge Transfer Network, there and then which was 8 weeks out [from the submission deadline] but we didn't hear anything. We got in touch again at 6 weeks out, didn't hear anything and then eventually we gave the application ourselves. We did actually manage to get in contact with XXX who then encouraged us to contact the KTN'.*

Focusing briefly on a more specific issue, several references were made to Innovate Edge, and the difficulties, and frustrations, that applicants expressed in getting advice from them:

> *'I am very disappointed about the [Innovate] edge aspect of this and I still haven't received a contact and this year I really would like to talk to an edge consultant, as there is a focus on the exploitation activities. Essentially, it is how are you going to commercialise this going forward?'*

> *'Well, we were offered contact with Innovate Edge…Okay, so it is a regional set up and it appears that they are sort of independent consultants who work under the banner of Innovate Edge. We were told that we could get support*

through them, I think they typically support people on the commercialisation side, which is the area where we didn't have experience and what we really needed at the time, was an understanding of the investment process for start-ups and how to get nano-grants for funding, for example. That's where we specifically asked for some expertise but unfortunately, we haven't received any. We did get in touch with somebody who said it wasn't their area of expertise but they would find somebody who knew about it and then we didn't hear anything. We did poke them, but then there was nothing'.

In our interviews with SSPP Challenge staff, it became apparent that individuals were aware of some of the issues with Innovate Edge, and that steps had been taken to improve user experience of this support offer, a position confirmed in the applicant quote below:

'This year we still haven't received contact from Edge, I've asked Innovate UK and I think they have been quite open to say the link between themselves and [Innovate] edge is not as robust and coordinated as it might be, and that I'd be better off approaching them myself. I don't think this is optimal, it is a referral basically. If I approach [Innovate] edge they will be like, who on earth are you? If Innovate UK approach [Innovate] edge, they have already filtered these guys out'.

The impacts of any changes to communications and engagement with Innovate Edge have not been considered and may benefit from further investigation and analysis during Phase 3 of the evaluation.

Provision of 'informal' advice and support useful for applicants, even if they did not request it

In the previous section, a definitional distinction was made with reference to 'formal' support, allowing us to focus on examples of more 'informal' support that applicants have drawn attention to. In defining 'informal support', we are referring to email discussions and Innovation Leads 'checking in' on projects and seeing how they are getting on with their application. An example of this 'informal' support is given below:

'The application process was quite lengthy for our organisation. We needed to secure input from different contributors. Throughout the drafting process, UK KTN and, I think someone from UKRI were periodically 'checking in' with us and asking how we were getting on, which was encouraging and allowed us to maintain a connection and a dialogue with them'.

Relationship development Is discussed further in Section 4.2, as part of our assessment of monitoring and performance management processes.

2.4.4   Applicant understanding of the assessment process

During interviews with project applicants, we received a lot of views, and feedback, on the assessment process that the SSPP Challenge Team have used to select projects and piece together their project portfolio. Before exploring these views in greater depth, it is worth summarising the assessment process, as it is understood by applicants, as appreciating their level of understanding of the process is important in positioning and contextualising their viewpoints.

Based on information collated from project applicants, they understand, whether rightly or wrongly, the assessment process as divided into three constituent parts:

> Assessment and scoring from the Innovation Leads and wider SSPP Challenge Team, where it is assumed that these individuals, which will also include the SSPP Challenge Director, read the applications, apply agreed scoring criteria to each section, score each section, tally the scores, and then provide an average 'project team score'.
> Independent assessment, where five independent assessors, with no direct links to the SSPP Challenge, review the applications, score them separately, and then average their scores. SSPP employed extra assessors to review additional questions contained in the application.
> Scoring matrix – several project applicants referred to some sort of 'scoring matrix', where all the project scores are *'organised into a league table'*, and those above a certain threshold (widely understood to be 70%) are funded and those below the agreed threshold are not.

The above bullets convey a mixed understanding of the assessment process among applicants, with some factual inaccuracies relating to assessment, scoring and funding allocation. With reference to assessment, the SSPP team do not score the projects, they remove any ineligible applications before an assessor is assigned.

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While 70% is the agreed threshold above which projects are deemed 'fundable', the amount of available funding means not all those scoring more than 70% will be funded.

However, an important element of the assessment process, which was not highlighted in any of our applicant interviews, was the portfolio balancing. A stage in the process that the independent assessors were not aware of, 'portfolio balancing' refers to the role that the Challenge Director has in selecting projects, to ensure a balanced and reflective set of projects, that adequately address the issues in the sector, and are well split across workstreams and according to value. The use and effectiveness of this portfolio balancing is discussed in Section 3, below, but the lack of reference to it, among applicants, points to an issue of transparency and the possible need to share more detailed information with applicants, where it might influence funding outcomes. There were examples of projects that scored above the agreed 70% threshold, that were not funded and not all of their projects leads understood why:

> *'I understand that they cannot fund everyone and I also get that there may be projects that score well but don't get funded. That said, in our case, we received really positive feedback; feedback that, when you read it, would make you think we would be successful, and then we weren't. It would have been good to get more information on why we weren't successful'.*

2.4.5 Applicant concerns over the effectiveness and fairness of the independent assessment

While much of the evidence contained here is derived from unsuccessful applicants, many of the issues covered were also discussed with successful applicants.

Lack of sufficient technical and scientific understanding among assessors?

Earlier sections of this report have highlighted the breadth of issues and types of projects funded under the various SSPP workstreams. This breadth, together with applicants' reading of individual assessor reports and feedback, led several to question whether the assessors assigned to an application, had the requisite technical and/or scientific knowledge to make a meaningful assessment of their proposal:

> *'We were, of course, disappointed when we didn't get it [receive the funding], but the comments that came back felt like they didn't understand the level of nuance, which I found quite surprising, given that it was SSPP who knew about sustainable plastics. There was not a huge amount of understanding about reuse on the panel. This was interesting, as we submitted it to another reuse fund, which it then won, which indicated that it was not our grant writing abilities, but people marking it not fully understanding reuse. It is quite different to recycling, which is something that we have noticed gets too mixed up for people, in particular in Innovate UK, they don't always differentiate between the two'.*

> *'Some of it [feedback] can be very conflicting, some of it would suggest the reviewer may not have read it in detail or really potentially understood. There may be an outlier where, really, they haven't understood and when you have four reviewers who get it, I don't think it's... In terms of the quality of [muffled].... we've had instances whereby there have been some very bizarre comments, suggesting the reviewer or reviewers may not actually understand the sector, or the application they're reviewing'.*

> *'Put simply, we felt the assessors had fundamentally misunderstood what the project was trying to do and what the project was about'.*

However, discussions with WRAP, including with individuals involved in challenge assessment, discussed the difficulties for assessors reviewing applications about an entirely new process or material:

> *'Sometimes, you almost need more data and information to support an application, but then you're in a chicken and egg situation. People don't want to give up too much information about sensitive technologies that they may be taking on board'.*

> *'If there was one comment I would make, it is making sure that the knowledge of the assessor is 'linked' to the applications. If assessments are done by somebody who is not completely up to speed with developments in an area, it can be difficult for them to make a judgement on key elements of the application. I wonder whether some sort of peer review process could be included, but then we return to the issue of sensitivities. It is really difficult'.*

Expectations of assessors appear to differ, suggesting 'preferences' in what information should be included and how

In reviewing independent assessor feedback, several project applicants commented on the different 'preferences' of assessors, including what types of information and levels of detail they like to see, and which questions they place greater importance on. This high degree of subjectivity, and a perceived lack of standardisation, makes it difficult for applicants to navigate the comments, and to know what feedback to prioritise and incorporate into a revised submission or next stage of assessment:

> *'The problem is you have 10, 11, 12 questions and you have 5 or 6 examiners and you always know from experience that depending on the examiner you get someone is going to love risk analysis or project plans etc, so you spend ages putting together these things like risk analysis plans and I find these things ridiculous because it's an early-stage feasibility project of course there's massive risks everywhere'.*

> *'What I found was a lack of consistency about the approach taken by the assessors. You would write the same paragraph and one assessor would say absolutely insufficient detail, you should have broken this down further into category, and in the same breath the next assessor would say far too much detail, needs a high level of strategic review',*

Some applicants went on to argue that the *'apparent lack of a standardised assessment approach and set of agreed criteria',* is evidenced in the wide-ranging scores that different assessors have given to the same application. While the decision to share assessor feedback with applicants has been widely praised, doing so has led to questions about scoring and whether standardised metrics and agreed expectations of what constitutes a particular score, are being correctly applied:

> *'Because of the inconsistent application of criteria by the assessor, the gap in the scores was quite wide. I completely understand, I remember watching the diving in the Commonwealth Games where they take off the bottom two scores and the top two, and use the middle two scores. I almost think that may be an appropriate way of scoring there. There are extreme views with regard to the feedback from assessors, that's what I found difficult to navigate'.*

As part of our preparatory work and programme familiarisation, we reviewed the assessor scores and scoring matrix used to support project selection. Within the 'line draw' spreadsheets for each workstream, all assessor scores for each project were recorded and a simple calculation for 'score spread' (the difference between the highest and lowest assessment score) was made. While the score spread in most cases ranged no higher than 15-20 points, there were examples, across all workstreams, where this spread was larger, in some cases over 30 points different. In some instances, these 'score spreads', largely the result of an assessor providing a low score, were debated, with 'true' outliers removed. However, the overall spread did appear to influence whether a project exceeded the 'fundable' threshold score of 70. For example, two projects in the FPPS workstream scored 69.9 and 69.5 respectively. However, in the first case, the score spread was 45 and the mean difference was calculated as 25.6. while in the second example, the score spread was 41 and the mean difference was 21.8. In both instances, while the incidences of 'true' outliers were removed, the overall spread meant some projects would have scored above the 'fundable' threshold and would have scored higher than some other applicants, including several successful projects.

Are they assessing the project concept or the ability of application authors to write a quality submission?

Relating to the above points about 'preferences' and assessment criteria, project applicants raised a question about what is being assessed. More specifically, how much emphasis is given to assessing the project, the concept and what it is hoping to achieve, compared with the applicant's ability to write a good submission. As discussed in earlier sections, several of the Challenge Team agreed that there should be a focus on the quality of writing and the applicant's ability to clearly articulate their project, its aims and objectives and perceived outcomes and impacts. However, applicants felt that, in some instances, feedback focused too heavily on 'style' and less on 'substance'.

3 Delivery of SSPP and contribution to Challenge objectives

Section 2 explored the scale, scope and focus of SSPP, and the suitability and effectiveness of key processes implemented to market and promote the challenge and facilitate the development and assessment of applications. This section, and associated Process Evaluation questions, focuses on the following four areas:

1. The award process and its role in securing a balanced project portfolio that aligned with challenge objectives
2. The responsiveness of challenge implementation to changing societal, economic and industry needs
3. The suitability and effectiveness of governance processes in supporting delivery of the challenge
4. The effectiveness of approaches developed to share and disseminate project findings and knowledge.

The specific PE questions are detailed in Table 7:

Table 7: Process Evaluation Question 2

> **To what extent did the project delivery contribute to achieving the objectives of the Challenge? What is working (has worked) well/less well and why?**
>
> \> PE2.1 Did the award process facilitate the selection of projects that were well designed and aligned to the Challenge Objectives?
>
> \> PE2.2 Was the implementation of the Challenge responsive to changing context and needs of industry and the nation, including Covid-19?
>
> \> PE2.3 How effective were the governance processes in the delivery of the Challenge, including sharing delivery with other organisations within UKRI?
>
> \> PE2.4 Has the challenge developed effective approaches for exploitation and dissemination of knowledge, processes, design etc? What more could the challenge do to support projects with these activities?*****

Source: Winning Moves revised Process Evaluation Questions originally taken from Evaluation Framework

3.1 PE2.1: Award process and selection of projects aligned to objectives

The award process for project selection was broadly similar to that used in other challenges, and included application submissions, independent assessments and project ranking based on the average of cumulative scores. However, as the quote below explains, there were two notable differences or additions, the role of the Challenge Director, who was able to use their discretion in 'balancing the portfolio, and the use of independent engineering and environmental impact assessments as part of the Demonstrator's selection process.

> *'To the outside world, and to directors and teams working on other Challenges, the process SSPP implemented to assess and select projects would be very familiar. We still had the application submissions, independent assessments, and obviously the scoring and review of those scores. However, where I think we were slightly different was in the role that the Challenge Director played in the process and the additional stages we implemented for some of the higher value and strategically significant workstreams, like Demonstrators.'*

3.1.1 Combining the use of independent assessment with 'Portfolio Balancing'

The use of external assessors, threshold scoring and ranking of projects, is the long-standing and preferred mechanism that ISCF and Innovate UK programmes have used for moderating and selecting projects to be funded. In the standard Innovate UK assessment model, five independent assessors review each application and provide a score out of 100. Projects that have scored above the threshold of 70%[6] are deemed fundable, with

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[6] While the minimum threshold across UKRI challenges is 70, the thresholds for SSPP were discussed and agreed for each competition against the score profiles.

subsequent allocation dependent on the monies available and the outcome of some 'portfolio balancing'. What the previous section highlighted were some of the perceived shortcomings or limitations of this approach, limitations that the SSPP Challenge Team recognised, and which led to the additional elements detailed above.

The single biggest limitation of the external/independent assessment process was its perceived ability, among the SSPP Challenge Team, to deliver a balanced portfolio of projects that would cover the breadth of issues and deliver against Plastics Pact targets and the other Challenge Objectives detailed in Table 4. While the scores give you a view on the quality of that project, solely relying on them could result in several projects addressing the same issue receiving funding, and too many or too few projects in individual workstreams.

To counter this, the SSPP Challenge introduced an element of 'portfolio balancing' (for projects that score 70% and are deemed 'fundable')', which effectively provided the Challenge, and its director, with additional scope to select projects, not only based on scores, but on strategic importance and alignment with objectives. The SSPP Challenge Team agreed that this element of portfolio balancing was needed to ensure the right mix of projects were funded:

'The final selection of projects, I think that it was done in a in a balanced way. So, we did, we went through the standard kind of assessment and selection process and then did that final portfolio balancing towards the end. And I think there was good reason to do that because the assessors can only provide their input based on their particular field of expertise at that moment in time. They weren't privy to the wider portfolio that we were building'.

'So, I think that the way I think it was done appropriately and for the reason of making sure that the challenge as a whole does invest kind of where it needs to across the supply chain in, in line with the challenge objectives'.

In discussing this approach with the SSPP Challenge Team and, having reviewed projects scores, and 'line draw' spreadsheets, there were instances of projects with marginally lower scores being successful, in place of projects with higher scores. It is important to state that portfolio balancing was only used to differentiate between projects that had scored over the agreed threshold and were deemed 'fundable'. No projects that scored below the threshold were selected in place of projects scoring over 70.

For example, within FS&IR the lowest scoring successful project scored 71.3, which is almost 6 points lower than the highest scoring unsuccessful project, which scored 77.5. However, this unsuccessful project was focused on biodegradable packaging materials and there were several similar projects that scored higher than 77.5, hence why it was not selected,

Within FPPS, according to the Line Draw spreadsheet 14 projects were selected and received a total of £1,706,312. Had projects been selected solely based on the average score and ranking, 14 projects would have received funding, however, 5 of the projects that were selected as a result of portfolio balancing, would not have received funding, including a behavioural change project, a project focused on pharmaceutical packaging, a SMART project using interactive labels to supporting waste sorting, and a project using cyanobacteria as a biodegradable and edible biopolymer. This illustrates the role of portfolio balancing in selecting a wider range of projects, addressing different issues, and using different approaches, including smart technology, alternative polymers, and recycling.

There was widespread agreement, including from wider stakeholders, that the Challenge had been successful in establishing this balanced portfolio, and that the Challenge Director, with their strategic oversight, had been integral to achieving this.

'We re-installed the role of the Challenge Director in terms of having that strategic view and saying, well actually that is right, it doesn't make sense for us to fund projects just because they are good, in their own right. We need to fund projects that will contribute directly to our targets'. I think taking this approach has led to a wide range of projects being funded and we are more likely to deliver against our targets and objectives'.

3.1.2   Using environmental impact assessments to support project selection

In recognising the importance of the Demonstrator projects, and the inherent risks of allocating significant funding to larger scale interventions, the SSPP Challenge Team decided to implement two additional elements to the assessment process, an environmental impact assessment, and an engineering assessment.

With reference to the former, SSPP is trying to reduce the detrimental environmental impacts of single use and problematic plastics. However, for the SSPP Challenge Team, it was important to make sure that proposed projects were not introducing other environmental impacts and unintended consequences that could be equally or even more damaging:

> *'If you look at the Innovate criteria, none of them tell you about environmental impacts. We decided, therefore, to introduce a requirement round environmental impact, i.e could the projects demonstrate that their impact on the environment was less than the impact or issue they were attempting to solve'.*

> *'We explored in more depth than almost any other IUK/ISCF activity, the environmental impact. We asked for quite detailed information, more detail as we got further up the TRL/size of grant, up to and including independent environmental reviews for the demonstrator projects. Now that's very unusual and I'm not aware of anyone else doing that. Expert reviews are used across innovation funding in different areas to augment and build upon the normal anonymous assessor approach, I've not seen it included to the extent that we did'.*

While the inclusion of these assessments was viewed as a positive among SSPP Challenge staff, for some project applicants, the question on environmental impacts was difficult to answer. Inexperienced applicants, in particular, were unclear on what information and evidence to provide, and could not remember whether any guidance had been given on how to structure a response. For these reasons, some applicants scored low on this question.

> *'We were very weak on that question, as my background is not in this area, it is in Physics, so my concept was, if you get people to reuse things it doesn't go into waste, here are the number of things that won't go into waste, then you have to translate that into the plastic targets and I didn't do it very well'.*

3.1.3   Balancing risk and reward – an acceptable tolerance

For the SSPP Challenge Team, project selection is not only about the achievement of Plastics Pact targets, but also about actively encouraging innovation, and for that innovation to be *'recognised internationally as a UK strength, and source of export growth and inward investment'*. Several of the SSPP Challenge team discussed the importance of having an acceptable appetite or tolerance for risk, if innovation is to be actively encouraged, and to recognise that not all projects that have been funded will succeed:

> *'So, we believe that if some of these things don't fail, we weren't taking enough risks because that's what innovation is, and we are trying to de-risk these thought experiments, these technical and social experiments, in order that they can be really well explored in a really robust way.'*

> *'I would say the appetite for risk has been reasonably good. We have funded a range of work on new materials that may or may not prove to be successful down the line. The level of investment in Chemical Recycling is indicative of our appetite for risk, and we have also put money into changing consumer behaviour.'*

As illustrated by the second quote above, the Challenge Team felt that the project portfolio struck an appropriate balance between risk and reward and that the Challenge has an accepted tolerance level for projects failing.

What was important for the Challenge Director, and for the Board, were the reasons why a project might fail. In requesting the submission of more detailed business plans and financial breakdowns, the SSPP Challenge was trying to minimise failure associated with project management, while tolerating failure linked to technical, scientific or research risk:

> *'Our tolerance to a project failing is more about the reasons around the failure. Bad planning, insufficient contingency, all the 101 stuff, does not look good for us. It is kind of OK for a project to fail, providing it fails for the right reasons. Failure due to technical risk has not only been tolerated, but we have embraced it.'*

3.2   PE2.2 Implementation responsive to changing context and needs of industry and nation

This sub-section looks at the responsiveness of SSPP implementation from three different perspectives. Firstly, how the challenge design and implementation 'evolved' from the original business plan to the final delivery plan, recognising the need to adapt to changing interests and needs. Secondly, how the agreed workstreams

focused on issues of importance to industry and the public, and thirdly, how the SSPP Challenge team have recognised other strategically important issues that future calls could focus on.

3.2.1   Ensuring continued relevance and long-term sustainability of the challenge and its activities

In aligning the objectives to Plastics Pact targets, the SSPP challenge has ensured its ongoing relevance until 2025, while the breadth of projects funded has made sure that a wide range of issues, albeit carefully targeted, are addressed. There was widespread agreement that the Challenge remains focused on the right areas and issues and that the projects being delivered will contribute to both immediate and longer-term solutions to single-use plastics.

> *'A key issue with all of these challenges is relevance. Over the lifetime of an intervention like this, there will be legislative changes, changes in public perceptions and a continual review of whether the focus of, in this case, SSPP remains relevant'.*

> *'I don't think we have hit a point yet, where we would have to do any kind of major pivot. Most of the investments we have made are still the right ones and I don't think the challenge has made any glaring errors. It is still supporting R&D, that will meet both Pact and longer-term targets. I don't think they have missed anything or failed to fund good projects in a given area. Everything that the Challenge wanted to cover has been covered'.*

As briefly discussed in Section 1.3, SSPP has funded several behavioural projects, recognising them as critical in sustaining change and continuing the direction of travel on key issues, particularly recycling, re-use and refill. Without behavioural change all parts of the supply chain, many of the projects funded will not gain traction and result in longer-term sustainable change. As several of the SSPP Challenge team argued, SSPP's success, and the success of specific projects, will be largely, if not wholly, dependent on positive behavioural changes:

> *To really influence a step change in the manufacture and use of sustainable plastic or alternatives to plastic, we need to change consumer and producer behaviours around that. The issue with behavioural projects reminds me of the adage, you can lead a horse to water, but you can't make it drink. Without behavioural change, a lot of the other technological and material developments we are seeing taken forward as part of the SSPP Challenge will not have the scale of impact we are looking for.'*

In securing buy-in from the supply chain, and through projects aimed at changing attitudes and behaviours towards the production, use and re-use of plastics, SSPP is ensuring continued relevance for projects and for the Challenge, and its aims and objectives.

3.2.2   Recognition of the need to address other issues

Two critical success factors identified by many of the SSPP Challenge Team, were *'sustainability and longevity'*. Through establishing new collaborative relationships across the supply chain, several wider stakeholders and the SSPP Challenge Team, are hopeful that the projects will develop their own inertia and become self-funded. The private sector will continue to invest and progress research and development projects through to scale-up and full commercialisation. This, it is hoped, will allow SSPP and similar challenges to move on and address different issues within Plastic Packaging, but across the sector more widely.

While there was some debate as to whether it fitted within the remit of SSPP, many stakeholders and the SSPP Challenge team, felt that the uncontrolled release of plastics into the environment is an issue that needs significant and immediate attention. Several went on to argue that recycling diverts material but does not deal with the wider issue of fugitive plastics, plastics that don't make it into the waste management system in the first place.

> *'One area we are going back to have a look at, as we don't have it as well covered as we would like, is littering, the uncontrolled release of plastics into the environment. There is an assumption that kind of says that if we do more reuse and re-fill, then we do more recycling, we will have less litter. I don't actually think that is a particularly safe assumption. I think what recycling does, it diverts material from landfill and incineration machine and that is a really, really good thing. But if the material never got into the formal waste management system in the first place, then you can recycle all you like, it doesn't matter, you are still going to have that fugitive plastic problem'.*

Littering was referenced in the original business case, in response to the Blue Planet 2 documentary; however, the project portfolio, as of mid-2022, did not include projects with the specific objective of dealing with fugitive plastics and their entry into the waste management system. There is consensus, among the SSPP Challenge

team and wider stakeholders, of a need for further action on littering and it will be for UKRI, and other interested parties to best determine how littering can be addressed, and how potential projects can align with, and support existing litter reduction initiatives, like the 'Litter Strategy for England'[7].

While littering was widely identified as a future area of focus, some projects, and stakeholders including WRAP, highlighted a possible expansion of activity in two further areas, 'flexibles' (that refer to flexible plastics like carrier bags, film, food pouches, and bubble wrap) collection and recycling, and the decarbonisation of plastics. A project funded via the core programme is an example of work in these areas:

> '[Project] is a really good example. We kept saying to UKRI that flexibles are the real problem if you are going to get 100% of packaging recyclable. You have to have flexibles being classed as recyclable. This means knowing how to collect them, knowing what you are going to do with them, how you are going to sort them and what they can go into'. SSPP has undoubtedly moved the dial in this area, and there are several projects looking at multi-layered films, but more needs to be done in the area of flexibles'.

> 'We know that SSPP are really keen to look at the decarbonisation of plastics, which is not covered at the moment. We can't do anything in that areas as it doesn't fit the brief. It will become increasingly important to demonstrate how plastics can be decarbonised'.

3.2.3   SSPP responsive to the 'disruption' of COVID-19?

Government-imposed restrictions to curb the spread of COVID-19 were first introduced towards the end of March 2020. With people's freedom of movement restricted and face-to-face contact only allowed outdoors, businesses across many sectors faced difficult circumstances and had, where possible, to adapt to their day-to-day operations and service/product offer. All organisations were forced to adapt to these measures and implement long-term changes to their working practices, to continue operating. For SSPP projects, alternative lines of communication and remote working became the priority, while activities requiring face-to-face contact, such as laboratory-based research and development (which impacted Enabling Research, FS&IR and FS4D projects, in particular), had to be suspended until the restrictions were eased or lifted. Where delays and postponements impacted significantly on delivery timetables, SSPP extended delivery schedules and were flexible and supportive during performance monitoring meetings. Many interview respondents, across all cohorts, praised the SSPP Challenge for their response, and for the flexibility and support they offered to projects:

> 'The first phase of our project was really short, it was meant to be three months, but COVID hit as the project started and the university was shut down for three months. We couldn't get any work done and we requested an extension, which the Innovation Lead was quick to action and the Challenge quick to grant'.

3.3   PE2.3 Effectiveness of governance processes in delivery of the challenge

3.3.1   Issues with application timetables and delays to allocation of funding

For several project leads, particularly those heading up university collaborations, the length of calls was considered too short and scheduled at inconvenient times, during the summer holidays, when many academics take leave from their research and other studies. The deadlines and timetables for certain workstreams also caused issues for Innovation Leads, and for the assessment process:

> I think the main thing affecting the application process for Enabling Research was the time frames involved. I mean it's the quickest call NERC has ever run. I wouldn't do that again. For everyone involved, the time frames were incredibly challenging. Whether or not that affected the quality of applications, it is difficult to say. It might have affected the number of them.

> 'The duration of the call was a real problem. It resulted from when the call was being announced and the timeframe within which the research itself needed to be completed. Now, we have actually seen a 1-year extension

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[7] The 'Litter Strategy for England' explains how government will work with groups and businesses to reduce litter. https://www.gov.uk/government/publications/litter-strategy-for-england

to the timetable because of the disruption caused by COVID, so that has given a bit more breathing space...But we didn't know that during the assessment process. It opened in January 2020, and all of the assessments had been completed by the end of September, which is about 3 months quicker than a typical call of that nature. It was also unfortunate that the peer review process took place over the summer holidays, which nobody thanked us for. There were many factors that would really make me not want to do it that way again'.

Some projects went as far as providing feedback to UKRI and the Challenge Team about the inconvenience that the scheduling caused:

'I gave them feedback, when they do their deadlines and timeframes, is to think about how they align this. When we had the two-three months for the feasibility study was the whole of the summer holidays, and a lot of us, as women, were involved in childcare, this disadvantages a women-led project compared to delivering a large piece of work across a period when there are no childcare requirements.

Related to problems with scheduling, there were examples of some projects experiencing delays between finding out they were successful and receipt of funding. This led to curtailed time frames for setting the project up, recruiting staff and getting the project up and running:

'We originally applied in January, intending to start in June, but were rejected around May time. About two weeks before the project should have started, we were told that we were actually successful. So, I think that we delayed the project start until July, just due to not finding out in time and it being a surprise. Especially working with two different universities, as they both have different formats for this. It was not really a difficulty, more just administrative stuff. It was also the height of Summer, it took a while as people were on holiday'.

3.3.2 The need for longer 'lead-in' and project set-up periods

Discussions with successful projects highlighted the issue of a lack of lead-in or set-up time for projects once the funding has been allocated. Some project leads recommended the imposition of a formal lead-in or set-up period of up to a couple of months before project delivery starts. Its current inclusion within the delivery timetable, effectively shortens the period when actual work can be completed and was reported to have placed unnecessary pressure on project delivery from the very outset:

'I think the biggest issue for many projects like this is set-up. It is too risky for businesses to start investing time and resource on project development and set-up until we know that we have been successful'.

'We cannot possibly have all the pieces of the jigsaw in place to hit the ground running on day 1. We need time to recruit staff, establish teams, purchase and set-up equipment, schedule laboratory time etc. There is a whole lot of preparation and set-up that needs to be completed before we can start work'.

'I don't know whether this is possible, but can the time and cost implications associated with project set-up be factored into the timetable and proposed funding awards? I felt like we were immediately behind the eight-ball and constantly playing catch-up against our agreed outputs, outcomes, and project milestones'.

3.3.3 Management and stakeholder engagement viewed as a real strength

All interviewees were positive about the management and governance of SSPP. Several of the SSPP Challenge Team stated that considerable time and effort had been spent to ensure the right blend of organisations and individuals, with the requisite skills, knowledge, and experience, had been brought together. Everyone in the team understands their respective roles and responsibilities and how these fit into the wider delivery of the challenge, while communication is open, clear, and transparent.

'We took our time in bringing together the project team, and I think we were successful in identifying the organisations and specific individuals needed. In my view, we have a balanced team with a strong blend of skills and, with UK KTN, we have a mechanism for engaging effectively with the industry'.

'There are a lot of moving parts to this challenge, but UKRI have been successful in bringing them all together and making sure that each individual and organisation knows their role and how their activities support overall delivery'.

'I think communication between UKRI and its delivery partners has been really effective, and people have felt comfortable in sharing views openly and there has been great openness and transparency, in general'.

The sentiments of the SSPP Challenge Team are shared with wider stakeholders and project applicants, with the latter complimentary about the visibility of the Challenge Director and Innovation Leads, the time and effort they have taken to understand their projects and the importance they appear to have placed on the development of meaningful relationships with projects and their leads:

> *'I've got a very positive experience with this whole thing. I think the monitoring has been really good, right, because that's served a really important role in making connections with group. There's also been these really, really great workshops and opportunities to meet the Challenge Team'.*

3.3.4   Work needed to establish a brand or identity for SSPP

Although a question only asked of the SSPP Challenge Team, we considered it important to explore their perceptions of SSPP branding and identity, and the perceived work that is needed to establish them. Several respondents felt that, to the outside world, it may be difficult to identify which organisations and individuals are leading the SSPP Challenge and, therefore, who projects should be listening to, and taking direction and advice from:

> *'If you are an external person, how does this all make sense? We had a real identity issue, and this becomes a problem when you are talking about optimising thought leadership. To achieve thought leadership, you need clarity on who is speaking. This remains a weakness, but we are optimistic that actions are being taken to improve it.'*

As the Challenge moves from delivery towards dissemination, several interview respondents emphasised the importance of establishing a coherent 'voice' and 'narrative' for SSPP, a voice that projects, stakeholders, and the whole industry, are aware of, can recognise, and will take notice of. The issue of a brand or identity becomes even more important if, like SSPP intends, the UK plastics industry are to become international, as well as domestic, thought leaders.

3.4   PE2.4 Effectiveness of approaches for exploitation and knowledge dissemination

Another area that the SSPP Challenge Team are beginning to shift attention towards is communications and, specifically the development of a coherent and structured marketing and communications strategy to provide a framework for disseminating impacts and key findings. For those involved in determining the strategic direction of SSPP, the challenge has always been viewed in two phases, set up and delivery and disseminating knowledge.

> *'So, we've structured the challenge in almost two halves or two phases. So, Phase 1 is get the project established, particularly ones that are going to be about building plants, building infrastructure, they need a long time to run. So, we had to concentrate on getting them setup. So that's the end of phase one. So, now Phase 2, now we have got something to talk about, let's go and talk with everyone, not just with a view of saying how great we are, but also helping our projects land in fertile soil'.*

However, to date, work on the second Phase has been limited and there remains a gap in communications and the need for this structured communications strategy:

> *'One of the areas we recognised there was a gap was in communications. We have done that, and we are seeing the fruits of that. The comms strategy itself, it is not surviving contact with reality very well. But I think we're getting a more sustainable strategy, communication strategy in place now and more executable. Frankly, we just didn't have the resource'.*

The lack of a detailed approach to communications has also been discussed with projects, with several unsure of the role that UKRI, UK Innovate KTN and NERC could and should play in publicising the findings from, and impacts, of SSPP:

> *'UKRI, I think when they announced the funding round that we were successful for the second project, they put out a press release so that was really useful but I'm not aware of any other channels for dissemination'.*

'We often get unsolicited emails from people who want to introduce us to someone, and we often email KTN to see if they know anyone, but it all seems rather unstructured. It is definitely useful to have them contacting people on our behalf, but I think there needs to be more organisation behind it.

'The GRIPS conference is great and allows us to meet lots of people from the industry, but there needs to be more of this type of thing. We need more opportunities and platforms to shout about our project. KTN and others know more organisations and individuals than we do and we need a coordinated approach to getting in front of them'.

3.4.1 The role of Innovate UK KTN, UKCPN and NERC in disseminating findings

The above quotes highlight the role that projects expect Innovate UK KTN, UK CPN and NERC to play in disseminating findings, specifically, providing opportunities to showcase and promote new technologies, materials, products and processes to influential stakeholders and organisations, throughout the supply chain, and across the public and private sectors. The Global Research & Innovation in Plastics Sustainability (GRIPS) conference[8] has widely been praised as an important networking event for the sector, and many projects have called for similar events, but with more opportunity to network and share scientific and technological developments:

'We haven't had direct support from UKRI, but I guess it is about them organising more events. We went to a KTN event recently and that was interesting because you meet people. We had a stand with information about what we do, and that allowed us to publicise the organisation to new audiences. More of those events are the way forward'.

'So, there was the GRIPS conference, where we have presented a couple of times, and this is really good from an industry perspective, but there is not a lot of science there, we obviously need other scientific conferences as well. More of these kinds of events are key, but ones where you actually get a chance to talk to people informally a bit and try to explain your work in a more accessible way'.

From discussions with Innovate UK KTN and NERC, it is evident they are working with projects to establish a communications approach or 'pathway' for sharing findings. Projects are being encouraged to support with the development of case studies, press releases, blogs, and social media content to share findings. Additionally, UKRI are working more closely with Innovate Edge to secure support for business growth and exploitation and making links with their Innovation to Commercialisation of University Research (ICURe) programme, which is a *'3-4 month cluster discovery programme designed using lean start-up methodology and Strategyzer tools…which trains, funds and supports teams led by university early-career researchers to determine whether there is a market for products or services that utilise their research, science or technology'.* Although currently closed, at the time of writing this report, up to £35,000 of funding is available to *'get out of the lab and validate commercially promising ideas in the marketplace'.[9]*

3.4.2 Projects expect to play a key role in communicating achievements, impacts and research findings

All completed projects will have something to share with the wider research community and the public and private sectors. However, according to some of the SSPP Challenge Team, the communication of these findings to UKRI, Innovate UK KTN, and other organisations, with the networks and audiences to push information out to wider supply chain, has been limited:

'Individual, project level exploitation is sort of inherent in the model because, towards the end of a project, we are always asking about their exploitation plans. What we are not seeing are plans for how projects will share information across the supply chain, rather than as a single commercial entity. This element is not there yet.'

Nevertheless, the quotes below highlight that projects are implementing different mechanisms for disseminating findings, including engagement with the general public, as well as companies, academic institutions and organisations within the Plastics Packaging Supply Chain. There is also recognition of the

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[8] The Global Research & Innovation in Plastics Sustainability (GRIPS) conference, is organised by the UK Circular Plastics Network and KTN. Part-funded by SSPP via a project under the Core Programme, it is a conference, exhibition and showcase that brings together companies and individuals to highlight the best of UK and international activities, which will lead to plastics being less likely to reach landfill, end up incinerated or become fugitive in the environment'. https://ktn-uk.org/events/global-research-innovation-in-plastics-sustainability-2/
[9] https://www.setsquared.co.uk/programme/icure-programme-2/

importance of data and sharing big data, even with competitors, in a bid to evidence impact, attract investment and progress research and development activities.

'It has an open-source principle at its heart. So, while there is a period of exclusivity at the minute, to protect those who put the money up, in the end everybody wins if this becomes industry standard'.

'On the data side, we realised that we had done a quick scan of the market to see what data we would want to collect, but actually there is not anything in the public domain about what is needed'.

'Yes, we are doing trade shows on our side quite often, once we have this new project and tech ready this will be something we will talk about as this is a big step. We will write articles about it for social media and trade publications, some people will showcase it in trade shows as well'.

'A magazine is the best way to call it. You know, a web-based resource which is for non-academic partners. So, to disseminate widely what we're doing early on. We've also started publishing, with one paper. We've got a special issue of a journal that it's going to be attached to. We're in the process of writing other academic papers'.

'But then we're doing a larger community event that will be happening on the back end of this year that our Innovation Lead has already been invited to. That'll sort of be more community focused and showcase some of the importance of that. And then I think there's the science, right? So that's those are paired up in terms of what the academic opportunities are, but also the industrial opportunities'.

There is also recognition of the need to share, not only the project findings and impacts, but relative success in the collaborative relationships that have been established, and which are discussed in greater detail, when answering Process Evaluation Question 4.

'I would really like to do a webinar about how we have worked together, less about what we have done but more about how we have built a coalition of competitors to solve these large issues, like big pharma worked together during the pandemic, big retailers can work together to solve a problem like plastic. So, there is a change in approach where competitors are realising they need to work together'.

4 SSPP internal monitoring processes and their contribution to achieving challenge objectives

The previous sections have focused on Challenge design and delivery. This section assesses the effectiveness of processes, procedures, and requirements for monitoring performance at both the project and programme levels. More specifically, this section explores the:

> role of benefits mapping and how monitoring of activities, outputs, outcomes and impacts capture SSPP progress.
> suitability and effectiveness of processes implemented to capture data and evidence of project and programme performance; and
> benefits, or otherwise, of procuring the evaluation in different phases, via multiple tendering processes.

In doing so, evidence is provided to answer the PE question, and sub-questions, detailed in Table 8, below.

Table 8: Process Evaluation Question 3

To what extent have the SSPP Challenge internal monitoring processes and activities contributed to achieving the Objectives of the Challenge? What is working (has worked) well/less well and why?

> PE3.1 To what extent did the monitoring of Benefits and Activities, Outputs, Outcomes, and Impacts reflect/capture SSPP progress and activities?

> PE3.2 Was data captured reliably and robustly? Were any issues encountered with data collection?

> PE3.3 Has the Challenge's approach to procuring the evaluation in parts, through multiple competitive tender processes, proven to be effective?*****

Source: Winning Moves Process Evaluation Questions, agreed with UKRI during evaluation planning and development

For UKRI, this is an important question in determining whether some of the changes to the monitoring approach have added value and can, therefore, be viewed as having had a positive impact.

4.1 PE3.1: The role of benefits mapping and monitoring activities, outputs, outcomes and impacts in capturing SSPP progress and activities

In reviewing the Benefits Map[10], there are twelve benefits that, in conjunction with the agreed Challenge Objectives, are being used to assess performance, achievement and impact. These benefits align with challenge objectives and have been written in a way that allows a qualitative assessment of performance. However, their usefulness in doing so has been questioned in relation to two issues.

4.1.1 SSPP challenge has yet to establish clear definitions and measures to assess performance against benefits

Some of the SSPP Challenge Team felt that the changes in content, from the business case to the final logic model, particularly in relation to the focus, aims and objectives of the Challenge, had not been adequately reflected in the benefits:

> *'That's great [the business case] but that's not what we are doing. There are loads of words in the business case that make us a hostage to fortune because we are trying to deliver benefits against things that we are not even addressing and that, as yet, are not referenced in the benefits or logic model'.*

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[10] For evaluation purposes, UKRI's Benefits Map is another name for the Challenge Logic Model, and includes the input, outputs, outcomes and expected impacts/wider impacts. The 12 benefits referenced are the SSPP Challenge Team's internal assessment of project and programme level impacts.

4.1.2 Difficulty in identifying achievement against qualitative benefits 'targets'

For others in the SSPP Challenge Team, there is the belief that targets, and statements contained in the benefits mapping exercise, are not numeric or directly quantifiable, and that achievement/performance against them becomes subjective, based on individual interpretation. This leads them to questions about how they can be used to manage resources and delivery:

> 'With the benefits, because they are not numerical, it becomes a bit of a judgement call, have we done enough on that benefit or do we need more on that one. It's actually quite a difficult thing to manage. You can judge the programme across the benefits but to actually manage it and say where do we need to put our effort? Where do we need to deploy extra resource to pick up in any gaps that it's actually it's very difficult'.

Further discussions are currently taking place to agree on the overarching purpose of the benefits mapping and to identify more appropriate definitions and SMART (Specific, Measurable, Achievable, Relevant and Time-bound) targets that can be used to monitor performance and achievement against them:

> 'At the outset, we recognised the importance of the benefits mapping exercise and the role it could and, perhaps, should play in monitoring performance. However, we were less clear on how the benefits should be drafted, the specifics around what each benefit would show us, and what evidence we would need to collate to illustrate achievement. We are discussing these now and are looking to refine the benefits in the coming months'.

These discussions, on refining definitions and developing more measurable targets, could have implications for the indicators used to assess impact and, therefore, the types of data and evidence that could need to be collected as part of the Phase 3 impact evaluation.

4.2 PE3.2 Was data captured reliably and robustly? Were any issues encountered with data collection?

In assessing the reliability and robustness of data collected to monitor project and Challenge level performance, we have focused on four issues identified through the qualitative interviews:

1. The SSPP Challenge Team's decision to implement more proactive monitoring that promotes relationship management over project management.
2. The role of monitoring officers and Innovation Leads in managing relationships and project performance.
3. Whether performance monitoring and reporting requirements, were proportionate for all workstreams and projects.
4. Whether information collated allows for an accurate assessment of project performance.

4.2.1 Proactive monitoring and relationship management understood in the context of projects funded

SSPP is delivering a smaller number of large-scale projects with significant levels of funding attached to them. Given this, and requirements to ensure meaningful contributions to Plastic Pact targets, the Challenge team reported taking a more proactive approach to management and monitoring of projects, and their activities.

> 'So, there are some projects that you know are way riskier than others, there's no doubt about that. And in those instances, what we would then try and do is manage that risk with the companies involved and we are definitely more active on that than most certainly Innovate UK. In other challenges, the modus operandi is to be witness, make sure we know what people are doing but don't intervene. Within SSPP, we are more active in this area'.

> 'For us, remembering how invested we are in these projects, we need to know if there's a problem and we need to know quickly. This requires more hands-on project management'.

This proactive approach to both project level, and Challenge level management, was felt to have allowed stronger relationships between monitoring officers, Innovation Leads and projects to develop, exemplified by the perceived availability of challenge staff to respond quickly to issues and queries that projects raise. It was also reported this 'relationship management' had encouraged a deeper understanding of individual projects and what they are hoping to achieve and enabled earlier identification of delivery issues or concerns with underperformance. These issues, which included delays to project start dates and difficulties with recruitment,

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to name but two, if not identified, could have resulted in larger scale problems that will require more resource intensive intervention down the line.

4.2.2   Productive and positive relationships with monitoring officers

The benefits of this more proactive and 'discursive' relationship between the SSPP Challenge and projects are reflected in the high regard that successful projects have for their monitoring officers and Innovation Leads. Before exploring these relationships in more detail, it is worth highlighting the importance that the SSPP Challenge team placed on the role of monitoring officers, the selection of experienced officers and the appropriateness of their workload. For several of the SSPP Challenge Team, the experience of the monitoring officers and Innovation Leads, and their ability to ask the right questions and extract the right information, are critical ingredients to effective and efficient performance monitoring:

> *'It largely comes down to the effectiveness of the MO and the Innovation Lead to ask the right questions because you can go to a project meeting and they tell you all the right things. Then it's up to the monitoring officer and the Innovation Lead to probe a bit more as to whether what they're telling you is absolutely on track, or whether they're glossing over. I mean, you can't force them to tell you if there are difficulties in a project. But there are questions you can ask. And, to make sure that you're trying to get us full picture as possible. So, in terms of the effectiveness of that process, it's good, but it does require a proactive MO and innovation lead. Otherwise, I think the projects, May not be as forthcoming, but about how it's going just because they're not aware of our need to really get an understanding of what's happening and how the monies are being spent'.*

> *'In other challenges you'll have one innovation lead managing hundreds of projects. We have said 'no', we want to know our projects, know what they are doing and how they are doing it. So, we'll gold standard monitoring, but our innovation leads are also heavily involved with those projects as well and are talking to the larger ones every week to understand what is going on'.*

According to several of the SSPP Challenge Team, the care and attention paid to recruiting MO's and Innovation Leads with the requisite skills and experience has resulted in honest, open, transparent, and very positive relationships with projects and their management teams. These relationships have been strengthened because of the additional time that MOs can now spend with projects, and their ability to respond quickly to questions and concerns.

> *'We had an amazing monitoring officer who was super understanding of the pressures that a small business like ours is under, they were really interested in the project but also incredibly professional, they clearly laid out what was expected of us and guided us through the process. They were everything you would want in a monitoring officer - supportive, clear, and there to do their job'.*

> *'We've asked some questions about Independent Accounting Reports, for example, and XXX has been super quick to respond, and if he can't help he will forward the question to someone that can. Communication has been good, the documentation is the only thing that I would change'.*

4.2.3   Mixed views on whether the amount of information requested is proportionate for different workstreams and projects

While expectations of both the frequency and scope/scale of performance reviews have varied between workstreams, project size and relative contributions to targets and objectives, there were discussions, and mixed views, about whether performance monitoring and reporting requirements were proportionate to certain projects. When compared with other challenges, the SSPP Challenge Team conceded that their reporting requirements are more extensive and that the expectations placed on projects are greater. Several also questioned whether the requirements had placed an unnecessary burden on the Challenge itself:

> *'We do ask projects for quite a bit of information and data about their delivery, and I wonder whether all of it is needed, and also whether we place an unnecessary burden on ourselves, reviewing data that we ultimately don't use in our assessments. I am not saying that we definitely ask for too much, but it is something to be mindful of when we engage with projects'.*

From our perspective, as an independent evaluator, relative to other evaluations we have undertaken across hundreds of policies, programmes and initiatives supporting innovation and business growth, the number of indicators far exceeds the number typical for evaluations of this nature. When viewed in conjunction with wider

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monitoring requirements and data collection for benefits mapping, (which includes some data requirements set out, and agreed to, in the Grant Offer Letters) this presents a greater burden to beneficiaries than might normally be expected, particularly for smaller projects and awards. Whilst we understand and recognise the need to consider multiple indicators to reflect the breadth of activity that the SSPP Challenge funds, the small number of individual projects to which certain indicators are relevant in practice make it difficult to justify their inclusion as an 'indicator' for the success of SSPP.

Our professional viewpoint is supported and evidenced through our experience of attempting, in parallel with this process evaluation, to collect the baseline and interim data requested by UKRI to implement the agreed evaluation framework. Alongside their baseline questionnaire submissions, several projects provided feedback that many of the indicators were not relevant to their projects and that they had to provide a 'not applicable' response to associated questions.

The question of whether the amount and depth of data requested from projects was proportionate, differed depending on the size and experience of the organisations responsible for monitoring, and the scale of the project. For larger organisations, and those delivering projects with greater funding allocations, the administrative burden, and monitoring requirements, were more manageable. Many already have the personnel, processes, and systems in place to collate and analyse the data needed, and benefit from previous experience of working with UKRI:

> *'It is no problem, we are a mature business, and therefore have systems in place that a research organization or smaller company might struggle with. In terms of our internal process, the idea of submitting time sheets, invoices that essentially are pulled off a Sage accounting system, are nothing new for us. Because of our maturity as a business we don't struggle to provide evidence of that information, so we haven't had a problem. The only thing I will say, because of the size of our organization and the size of the grant we were required to do an independent accountant report for the first quarter as well as q4 and I found that a bit frustrating'.*

However, smaller and less experienced companies have struggled with the data requests and reporting requirements, viewing them as overburdensome, and disproportionate to the size of the project they are delivering:

> *'The monitoring is quite cumbersome, I feel like the monitoring for the 30K we got for the feasibility study is akin to the monitoring we got for the £3.4 million, it felt like overkill, with a lot of paperwork'.*

> *'It is interesting, I don't know if we would ever do a grant with Innovate UK for that amount of money (£25,000) now, and feel like it was proportionate, as it was a lot of work. That said, at the time it was really pivotal for us, we were happy to do this level, because it was the first grant that we ever received. to answer the questions, the level of bureaucracy and admin that Innovate UK projects bring always makes me think twice about what we would do if we won it'.*

As was also the case for the application process, the SSPP Challenge has done their best to establish, from scratch, an effective performance monitoring framework that is implementable across all the different workstreams and that is understood and 'useable', by organisations of varying sizes and levels of experience in providing monitoring data. The breadth, scale and scope of the Challenge have presented difficulties with the design and implementation of certain processes, but steps have already been taken to improve them.

4.2.4 Challenge Team concerned whether monitoring data allows for an accurate assessment of performance and progress

The suitability of some data to provide an accurate assessment of project performance was also raised by members of the SSPP Challenge Team. The team has identified several possible adaptations to the monitoring processes, including a need to adapt the 'scoring rubric' or framework, as these scores are often deemed not to be reflective of the written assessments that accompany them. This mismatch between the scores and written assessments is leading to inaccurate project reviews and issues of underperformance being missed.

> *'It became obvious that the scores generated through the Innovate UK rubric provided, as part of the standard sort of package, weren't really giving us an indication of impending problems. The narrative was we had a problem on several projects, and those projects apparently were scoring well monitoring wise and then suddenly had problems. That was all a bit of a nasty shock for some projects.'*

'We have changed the way the scoring is done. We found the scoring wasn't quick enough. We had officers that were writing really accurate reports, but the scores, when you were applying the guidance, didn't really reflect what was going on with the project.'

As the second quote above highlights, the SSPP Challenge Team have already changed the scoring and it will be interesting to explore the impacts of these changes as part of the Phase 3 impact evaluation.

There is also recognition, that while changes are needed, their implementation will take time and will need to be iterative. Innovate UK has a long-established and well-understood monitoring process and any shift away from this will need to be carefully managed and implemented.

4.3   PE3.3 Procurement of evaluation in parts, through multiple tendering processes

UKRI have decided to procure the SSPP evaluation in three phases and to have separate competitive tendering processes for each phase. Phase 1 saw Eunomia establish an evaluation framework and identify a comprehensive list of baseline indicators, against which both project and challenge level performance and impacts can be measured. Phase 2 has seen us build on Eunomia's indicator work through collating baseline data from successful and unsuccessful projects, from UKRI, and from publicly available sources. Phase 3 of the evaluation, which should be tendered for during the first quarter of 2023, will provide UKRI with detailed assessments of impact and Value for Money (VfM). Based on our experiences of completing Phase 2, we have made the following observations about a multiple phase approach:

> Multiple tenders provide the opportunity for a fresh perspective on how the evaluation can be approached, together with 'built-in' periods of reflection regarding the quality of work completed. Even if the same organisation is successful, the process has invited new organisations to submit their perspectives and approach, which can add value to delivery.
> There are cost and resource implications for UKRI, associated with designing, implementing, and managing each procurement process, and with ensuring each new contractor's familiarisation with the project. A single, continuous evaluator would not have this requirement.
> Related to project familiarisation, each phase may benefit from an initial period of 'challenge and discussion', where new evaluators can advise on what may need changing about the approach agreed with the previous contractors. This was done, to some degree, for the process evaluation, but given that the collation of quantitative baselining and impact data was largely to inform the future evaluation of impacts, the approach itself and agreed list of indicators was given less scrutiny prior to data collection than UKRI may wish to employ for the final evaluation.
> Each phase could also benefit from a detailed review of the programme logic and other key documentation, to ensure they remain up to date and relevant, and take account of ways in which the project may have evolved over time.
> If not already in place, UKRI could benefit from ensuring that any appointed contractor has a contractual obligation to consult with the new contractor at the start of the next phase. This was carried out between Phase 1 and 2 contractors, but we are unsure if this was agreed informally or formally.
> It should be noted the same flexibility afforded through multiple procurement rounds, could be achieved through the insertion of simple break clauses in the initial contract. That way, the option to go out to tender midway through the process still exists, while also providing the opportunity to continue with all or some of the work that a previous contractor has delivered.

5 Value creation and wider impact on Plastics Packaging

Rather than focusing on the design, delivery, or management of SSPP, the final Process Evaluation question, and sub-questions, look to the future and explore the longer-term impacts and 'legacy' of the Challenge. To what extent has the SSPP Challenge established a framework and/or way of working that will enable the continuation of the projects and collaborative partnerships beyond the end of the current lifecycle to 2025?

At the time of writing this report, we can provide meaningful early responses only to the four sub-questions, detailed in Table 9 below, viewing the others as more applicable to the Phase 3 impact evaluation, when a greater proportion of the project portfolio will have been delivered, and there is scope for more accurate data and evidence to be collated and analysed.

Table 9: Process Evaluation Question 4

> **Has the value created by the Challenge, as a whole been, greater than the sum of its parts?**
>
> \> PE4.1 To what extent has the sector, *as a whole,* been strengthened *by the Challenge*?
>
> \> PE4.2 *How effective were* the various Challenge workstreams in *enabling new* collaborations *and partnerships*?
>
> \> PE4.3 *Is there evidence of synergies between the workstreams?*
>
> \> PE4.4 *Have sustainable solutions been supported that will continue beyond the lifespan of the Challenge?*

Source: Winning Moves Process Evaluation Questions, agreed with UKRI during evaluation planning and development

5.1 PE4.2 How effective were the various Challenge workstreams in enabling new collaborations and partnerships?

It is difficult to separately answer the above question on collaborative working and the next question about strengthening the sector, as many project applicants and wider stakeholders have identified the former as the most important development and change in supporting the latter. However, to avoid repetition, the answer to this question has focused on the collaborative relationships developed during project development and delivery, while the question of sector strengthening has been approached from an industry-wide perspective, reflecting on how collaborative working and partnership development has improved since 2019, prior to SSPP's implementation.

5.1.1 SSPP encourages collaborative relationships to facilitate project design and delivery

Beginning with project level collaboration, there was widespread agreement that the SSPP challenge has been effective in developing relationships within and between academic institutions, and between these institutions and the private sector. Indeed, evidence of the existence of such collaborations was a pre-requisite for receiving funding under certain workstreams.

Several project leads stated that completion of the written application necessitated engagement with departments and colleagues that they had not previously engaged with, together with inputs from specialists at other universities and research institutes:

> *'I'm working with academics in my own university, who I'd never worked with in any capacity before. So, XXX, who's co-lead with me. I'd never worked with before, so she's in a different area. She's in org studies, so not in the same department as me. We are also working with other departments in the university, including with XXX in Chemistry. So, definitely this process (applying and receiving SSPP funding) has helped develop interdisciplinary connections and I think also this process has opened up new partnering with external partners'.*

For some, this collaboration during the application process, while valued and encouraged, was difficult to manage, with one project lead likening it to *'herding cats':*

'Getting everyone to provide their inputs to the application on time, and in the right format and word limit, was a real challenge and at times I felt like I was herding cats. Collaborative relationships are fantastic but managing all the various individuals and moving parts can be difficult'.

5.1.2 Establishing links with the private sector to support scale-up and commercialisation activities

For projects funded under the Enabling Research workstream, development of collaborative relationships was less about supporting project delivery and more about the next steps in their journey towards commercialisation, including scaling-up and testing outcomes for their funded activities. The scientific and technical elements of their project required specialist knowledge and expertise that the SSPP Challenge Team and Innovation Leads would not have known about:

'We didn't receive much support from SSPP in developing links with our academic colleagues in other institutions. This project is highly scientific, at the cutting edge of current science. It is also very technical and there were probably only a handful of people in the country capable of supporting this idea and taking it forward'.

'All of our collaborative relationships with XXX university have existed for many years. We knew immediately who to go to with the idea and had agreements in place before we applied for the funding'.

However, where SSPP has been very supportive is in developing links with private companies that have the financial resources and personnel to progress new products, materials, technologies or designs and take them from the laboratory and into the market. Several projects with Enabling Research, BLR&D, and the Demonstrators, have praised the roles of Innovate UK KTN and the Innovation Leads in brokering links with companies in the private sector

'XXX at UK CPN and our innovation lead, have both played important roles in identifying potential private sector companies who may be interested in scaling-up our activity'.

'We formed a very good relationship with the project lead, XXX and, through SSPP, she has been trying to get us some external engagement from industry. She has brokered early conversations with XXX and various other end users. This relationship is proving to be invaluable in making industry links. I don't think we would have known who to approach without her help'.

'XXX has been excellent in terms of making introductions. But UKRI is just a name really unfortunately, I don't know if they're supposed to be active and how it all translates, whether XXX is deemed to be UKRI. It's just been him really. He seems to have a keen interest in what we're doing and has passed on any enquiries or opportunities. I think he's the Innovation Lead for our competition'.

5.2 PE4.3 Is there evidence of synergies between the workstreams?

As discussed in Section 2.2 each of the competition workstreams form an important part of the recognised commercialisation process that sees products, processes, and technologies progress from 'proof of concept' and research and development through to use at an industrial or commercial scale. Stopford Projects Limited's case study illustrated how projects that have previously been funded during earlier stages of technology readiness (TRL) can be supported in Research and Development and Demonstrators to further progress their activities towards full commercialisation. Other examples of such 'progression', include Unpackaged Systems Limited who are developing a standardised system for enabling refilling of customers' reusable containers, and have been funded under FS&IR and BLR&D, Haydale Composite Solutions Limited that has received BLR&D funding to build on the HiBarFilm feasibility study (funded under FS4D), to develop high barrier monolayer films for food packaging applications, and Notpla, who received funding via FS4D and FPPS workstreams.

Projects currently funded under Enabling Research (ER) and the two feasibility workstreams could well be funded to progress their research and development activities in later SSPP challenge calls, or via other Challenges.

5.3 PE4.1 To what extent has the sector, as a whole, been strengthened by the Challenge?

Encouraging private sector engagement is an important contributor to the overall strengthening of the sector. Their interest, financial investment and resources will be critical for the ongoing success of many of the innovations that have been researched through SSPP. Several wider stakeholders have referred to 'legacy' and the role that SSPP has played in developing potentially longstanding partnerships between segments of the plastics packaging supply chain that had previously never engaged with one another'

> *'Projects will always talk about what happens next and will always be concerned about where the next package of available funding is. With SSPP, one measure of success will be whether communities of organisations remain beyond the end of the Challenge. Will projects and their continuation become self-funded and be sustained through the partnerships they have developed'.*

> *'For me, this Challenge has been about strengthening relationships between key players in the Plastics industry. It's been about fostering new links and relationships and about establishing that end to end journey. I don't think we have ever really had all the links in the chain connected. I think different parts of the supply chain are starting to see how their activities influence those of others. Plastics manufacturers are looking at end use and recycling, how can they make their products more recyclable and how can they introduce recycled materials into their products'.*

The above quote highlights the growing recognition of the inter-connectedness of the supply chain and how different segments, that previously worked in 'bubbles' or 'silos', are now communicating with one another and developing meaningful partnerships.

> *'I guess the whole thing of having different companies working together more and more, crossing boundaries, having start-ups working with big companies, providing them with solutions, it is happening more and more'.*

> *'It [partnership working] is increasing, UK Plastics Pact are doing a collaborative session with retailers. I'm not sure its increased that much in the last two years, but it is starting to increase now. However, in areas that I'm not involved in, like flexible plastics, there is a fund where people have had to work together to get flexible takeback working in stores'.*

> *'It is helpful to connect so people can see what is happening with other companies and sectors, it makes us stronger as an ecosystem. I have met people randomly at events that I then since met again in a meeting, so we might do things together later, we would not have met without the event'.*

5.3.1 Changing attitudes increasing the pressure on plastics manufacturers

As referenced in an earlier quote, the success of many projects will depend on making longer-term changes in peoples' perceptions of, and attitudes towards, the production, use, recycling and re-use of plastics. Through the behavioural projects that SSPP has funded, there is evidence of a clear shift in how consumers view and use plastics. For many, this shift in attitudes is beginning to put pressure on the industry and is forcing them to engage with the issue of problematic plastics:

> *'People are much more concerned about where their products come from, and how they are made which is all putting more pressure on the industry too'.*

> *'Historically, there has been a lot of greenwashing. Companies have said they are using more recyclable content in their products, we are sustainable etc. without those numbers actually holding true. The government are much more aware of that. We have been involved in a project to create a standard to measure the recyclable content within packaging and we have created a standard on the back of that, on behalf of the UK government on things that will move industry away from greenwashing'.*

> *'There is genuine engagement from industry to get involved in these projects. Whereas, previously it has been that 'Yeah we will say we're involved but only to say that we're involved' and nothing more than that'.*

While the SSPP Challenge is not solely responsible for these changes in attitude, the projects they are funding are raising awareness of the issues and leading people to consider how they engage with plastics, which can only be positive in the collective work to create a more sustainable sector.

5.4 PE4.4 Supporting sustainable solutions

The question of sustainability sparked an interesting debate, among project applicants, about balancing the need to address plastics already in the waste management ecosystem, with the production and manufacture of biopolymers, aimed at reducing the amount of new plastics entering the supply chain. For some, particularly unsuccessful applicants, SSPP had potentially 'muddied the waters' on these two interrelated, but ultimately separate issues, and had not made it clear what the primary focus of SSPP was:

'Only 9% of all plastic gets recycled and recycling is not sustainable. It is what we call greenwashing'. We have [bio] materials we think can work, but we are a small company of only nine people right now, and we are competing with a multi-billion-dollar industry'. It is a big-time investment, it is people, it is capital'.

'We are not sure about the title 'smart, sustainable plastics'. For us sustainability is all about finding alternatives to plastics and using organic materials to do this, materials that can bio-degrade quickly and not be left in the environment. Yes, recycling is important, but the bigger issue is alternatives to plastics. This is what a programme like SSPP should be focusing on'.

Whether or not these reflections of the programme are accurate, and whether people agree with the term 'sustainable plastics', it has prompted discussion about what the future focus of SSPP should be, and whether or not there needs to be different challenges that offer more targeted funding in these different areas.

Related to the above, Some SSPP Challenge Team and wider stakeholders questioned whether aligning with the Plastics Pact targets had prevented some potentially innovative projects from being funded:

'Personally, I am not sure that the Challenge (SSPP) funded enough alternative material projects, and this was driven by being closely tied to the WRAP Plastics Pact targets. This alignment has limited the degree of innovation in areas that Innovate UK would normally have been looking for. SSPP money is aligned to the targets, and this may not have allowed everything that could have had a significant impact, in this space, to be funded'.

In our view, and reflecting the positives of this debate, SSPP has sought to influence change in three prominent issues currently being discussed among individuals and organisations working in plastics, removing plastics via recycling, removing plastics through production of alternative materials that use organic and biological matter, and understanding supply chain and consumer behaviour and how this can be used to influence decision making round production, use, re-use of plastics and reducing the amount of plastic waste generated in the first place.

'For me, SSPP is looking at three issues; use of alternatives to plastics, reducing the production or use of plastics; and our area, understanding consumer behaviours. All of these are really important issues that are appropriate to be focused on here'.

The Challenge has also recognised the importance of dealing with fugitive plastics that currently do not make into the waste management system to be recycled. These issues are longstanding and ongoing. By focusing on them, the SSPP Challenge secures its ongoing relevance and the continued need for investment in recycling, re-use, and new materials development.

6 Conclusions and recommendations

This Process Evaluation had two principal objectives, which were to assess the effectiveness of key processes implemented to deliver the SSPP Challenge and to use the evidence collated, and which has been reported and discussed in previous sections, to answer four overarching Process Evaluation Questions. These questions, while separate, are inter-related and have covered processes associated with the design, delivery and monitoring of the Challenge and its activities, and 'early stage' perspectives on the role of SSPP in creating additional value, and wider impact across the Plastics Packaging supply chain.

This final section, structured according to each of the overarching, and supporting Process Evaluation questions, summarises the key findings, and extends our input to include a series of recommendations, with some derived directly from respondent interviews, and others developed via our understanding and perspectives of the findings.

6.1 PE1: To what extent did the design of the SSPP Challenge, contribute to achieving the Objectives of the Challenge?

6.1.1 PE1.1: Were the Goal, Vision, Aims and Objectives of the Challenge relevant to the problem that it sought to address?

> SSPP was established shortly after the Blue Planet 2 series aired. This placed the issue of problematic plastics in the public consciousness and prompted central government to take notice and realise that something needed to be done. This provided an opportune moment for the design and inception of the SSPP Challenge, increasingly the likelihood of the Challenge realising its outputs and impacts.

> The alignment of challenge objectives to UK Plastics Pact targets were widely considered, among all interview cohorts to be a shrewd decision from the SSPP Challenge Team, one which guaranteed, to some extent, the immediate and ongoing relevance of the Challenge to the problems it sought to address:
>   o They were developed following consultation with the plastics supply chain and key decision makers, allowing for supported and buy-in to be more easily garnered.
>   o The Challenge objectives also aligned with Plastics Pacts in Europe and India, providing a basis for establishing international links and collaborations, fostered through a mutual understanding and recognition of the issues
>   o The Plastics Pact targets provided an appropriate focus on prominent issues and concerns facing the sector, including dealing with problematic and fugitive plastics, which could be addressed through recycle, reuse and development of new polymers from recycled plastics. or alternative materials.
>   o Related to the above use of Plastic Pact targets established the framework and agreed boundaries for activity.

6.1.2 PE1.2: Alignment of challenge workstreams with each other and with the needs of industry

> The agreed workstreams appear to align well with each other and the needs of industry, based on feedback from stakeholders and applicants alike.

> The individual workstreams reflect the commercialisation process and technology readiness levels that projects must progress through from proof of concept and R&D through to industrial/full market commercialisation.

> Progression towards commercialisation within the SSPP Challenge has been highlighted through several case examples where projects have received funding under Feasibility study workstreams and progressed through to later technology readiness levels via BLR&D and Demonstrators.

> Through the core programme, UKRI and wider stakeholders, recognised the need for overarching projects to tackle various barriers preventing the effective function of the plastics packaging supply chain, including a focus on standards for establishing collaborative relationships, education, and training for producers on polymer design, and testing the suitability of new polymers for food plastics.

6.1.3   PE1.3: Appropriateness of funding structure for delivering Challenge objectives

> The allocation of funding and the funding structure were appropriate and struck the right balance by supporting projects that will contribute to Plastics Pact targets, together with projects that future proof longer-term progress and development of new concepts, technologies, processes and materials.
> There was widespread agreement that UKRI made an informed and justifiable decision to focus on large-scale demonstrators, projects that were more likely to deliver impacts and contribute to Plastic Pact Targets – widespread agreement from projects and wider stakeholders.
> The decision to structure funding to include significant private sector match funding played an important role in de-risking investment and securing longer-term support beyond the Challenge lifetime.
> Funding has allowed innovative ideas to be explored and researched at lower risk to companies and academic institutions, encouraging R&D activities.
> Wider stakeholders and projects are supportive of SSPP Challenge's decision to fund behavioural change projects, which they argue have encouraged the supply chain, particularly producers and retailers, to understand behaviours and use findings to influence decision making.

6.1.4   PE1.4 Processes that could be adapted or improved for future SSPP calls and other ISCF Challenges

Raising awareness

> Use of existing networks and membership organisations were viewed as a highly effective mechanism for attracting prospective applications.
> However, these events were not as effective at attracting new organisations that didn't have a pre-existing relationship with UKRI, Innovate UK KTN and CPN.
> Attempts were made to attract new organisations, via marketing and promotion in recognised trade publications, but these were identified as not having had the desired effect of attracting new organisations and collaborations into the Challenge.
> Several projects (principally unsuccessful projects) raised concerns about selection bias in favour of projects that have an existing relationship, a track record in successful delivery and an existing level of trust. It is unclear to what extent such bias exists; however, it is also to be expected and completely understandable given the scale and focus of projects funded and need to evidence contribution to Plastics Pact targets i.e. for UKRI to be confident in the ability of the organisation to deliver tangible impacts prior to 2025.
> Launch events were perceived to be of limited use by experienced organisations, with content viewed as repetitive and not particularly informative. Smaller organisations, however, found them useful in explaining the application process and in starting their thinking in relation to internal processes and procedures.

SSPP application process

> There was support for the 2-stage written application process (used in Demonstrators Round 2); however, projects also felt that the first stage was too similar to the second, and requested too much information, including information not readily available at stage of project design/development.
> Several project applicants commented that the phase 2 application process was too repetitive, with applicants struggling to identify what information was needed to answer certain questions and whether framing of response needed to be altered.
> There was overarching agreement, among project applicants, that the application process, as it stands, is too resource intensive and 'geared up' for larger organisations with more staff, previous experience of applications and access to 'boiler plate' templates for key/commonly requested information.
> These resource requirements can be off-putting to new start-ups, charitable and less experienced organisations and reduce the likelihood of them submitting future applications.
> However, the application process was perceived as important in supporting the formulation and crystallisation of ideas and in progressing design and development.

Role of Innovate UK KTN and Innovation Leads in supporting

> It is important to note that not all applicants actively requested or sought support from Innovate UK KTN and Innovation Leads.
> The predominant view among SSPP Challenge Team was that the support was important, well received, and had an impact on the likely success of submissions.
> Applicants considered the additional resource made available for application support to be useful in developing project concepts and ideas.
> Support offered varied according to the type of project. For research and development and more technical projects, support centred on drafting key sections, rather than commenting on technical and scientific elements of the project. This was deemed as appropriate and useful
> Several projects referenced the difficulties of engaging with Innovate Edge. The SSPP Challenge Team have already recognised issues with this collaboration and have taken steps to improve this.
> Applicants were positive about the informal support from Innovate UK KTN and Innovation Leads, even when they had not requested it.

Assessment process

> Applicants appear to have a good understanding of the assessment process, however many were unaware of the additional role of the Challenge Director in 'portfolio balancing'
> Many of the issues raised in discussion reflected the scope and breadth of the SSPP Challenge and difficulties associated with assessing such an array of projects, across multiple workstreams, and issues within the Plastics Packaging sector.
> Concerns were raised about the technical and scientific expertise of assessors and whether they were always best placed to review and provide scores for certain projects. However, it was also understood that some projects were particularly innovative and that it would be unfair to expect assessors to always grasp the science and technical considerations that underpin the application.
> Related to the above, several queried the focus of the assessment process and how much 'weight' should be given to the project concept, compared with the quality of the written content.
> Both our review of assessor feedback and reflections from project applicants, identified a possible lack of standardisation and an over-reliance on subjective views when scoring projects. For example, two projects in the FPPS workstream scored 69.9 and 69.5 respectively. However, in the first case, the score spread was 45 and the mean difference was calculated as 25.6. while in the second example, the score spread was 41 and the mean difference was 21.8. In both instances, had the lowest score been removed, the projects would have scored significantly above the 'fundable' threshold This was reflected in the 'score spreads' recorded in the 'Line Draw' assessment spreadsheets.

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Recommendations relating to PE Question 1:

> Innovate UK and UKRI should consider opportunities to secure more applications from organisations and partnerships that are new to the SSPP Challenge. This could be achieved by 'ring fencing' a proportion of funding, either through a specific workstream or separate call, that only certain types of organisation can apply for.

> When establishing workstreams or how funding might be allocated, consideration of organisational characteristics and levels of prior experience, could be useful in targeting processes and types of information. For example, inexperienced applicants may benefit from more information and greater detail on the process and selection/eligibility criteria, detail which may not be needed for more experienced applicants.

> With reference to the latter, the application process could be adapted to make it less burdensome and more tailored to smaller organisations and those with no, or only limited, previous experience of applying for Innovate UK or ISCF Challenge funding.

> Among applicants who had not formally accessed support, not all were aware that support from Innovate UK KTN and Innovation Leads was available. Given the positivity surrounding the usefulness of support, any additional mechanisms to further promote available support could be beneficial for applicants. Such support is particularly useful for new organisations, without pre-existing relationships with UKRI, and perhaps these should be targeted with any promotional activity.

6.2 PE2: To what extent did the project delivery contribute to achieving Challenge objectives?

6.2.1 PE2.1 Did the award process facilitate the selection of projects that were well designed and aligned to the Challenge Objectives?

> Combining the use of independent assessment with 'portfolio balancing' was widely viewed as a strength among SSPP Challenge Team and wider stakeholders.

> The role of the Challenge Director was viewed as integral to securing a balanced portfolio of projects, with discretion appropriately used to select projects in workstreams with more applications, where several projects were addressing the same or similar issues, and where a reliance on simple scores would have seen projects in other areas, such as behavioural change, not receiving funding. This would not be possible if the process solely relied on independent assessment and project 'ranking'.

> Project applicants and wider stakeholders understood the introduction of environmental impact assessments for the larger-scale demonstrator projects, but many referenced struggling with how best to answer this question in the application.

> There was consensus, across all interview cohorts, that the Challenge had established a suitable 'risk tolerance' for projects, that allowed innovative projects to be researched and explored whilst still ensuring delivery and contribution to targets from larger-scale demonstrators. The SSPP Challenge Team accepted that projects may fail but were clear on the reasons why projects should fail.

6.2.2 PE2.2 Implementation responsive to changing context and needs of industry and nation

> The continuation of the Plastics Pact and SSPP's alignment there with has ensured SSPP's ongoing relevance until 2025, while the breadth of projects funded has made sure that a wide range of issues continue to be addressed.

> Related to the above, a focus on behavioural and attitudinal change is beginning to 'move the dial' in terms of increasing interest and engagement from plastics producers and 'big brands' in the role that behavioural science can play in influencing their decisions.

> There was widespread agreement about the need to address fugitive plastics and littering under future challenges, although people were unsure, whether such a focus should fall within the remit of SSPP.

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6.2.3 PE2.3 Effectiveness of governance processes in delivery of the challenge

> Several project leads felt the length of some calls (particularly Enabling Research) were too short and were scheduled at inconvenient times, during the summer holidays, which inconvenient for most people but particularly for academics who can only take leave at certain times of the academic year.
> The deadlines and timetables for certain workstreams also caused difficulties for Innovation Leads and for the assessment process.
> Some successful projects highlighted the lack of lead-in or set-up time for projects, time that is needed, but that currently forms part of the delivery period. This shortens the 'actual' delivery period and places immediate pressure on projects to play 'catch-up' against their delivery outcomes.
> All interviewees were positive about the management and governance of SSPP. Several of the SSPP Challenge Team stated that considerable time and effort had been spent to ensure the right blend of organisations and individuals, with the requisite skills, knowledge, and experience, had been brought together.

6.2.4 PE2.4 Effectiveness of approaches for exploitation and knowledge dissemination

> For those involved in determining the strategic direction of SSPP, the overall Challenge has always been viewed in two phases, set up and delivery and disseminating knowledge.
> To date, work on the second phase has been limited and, at the time of completing the interviews, there remains a gap in communications and the need for a structured communications strategy.
> The lack of a detailed approach to communications has led to projects being unsure of the role that UKRI, UK Innovate KTN and NERC could and should play in publicising the findings from, and impacts, of SSPP.
> Projects identified a clear role for Innovate UK KTN, UK CPN and NERC in disseminating findings, specifically, providing opportunities to showcase and promote new technologies, materials, products and processes to influential stakeholders and organisations, throughout the supply chain, and across the public and private sectors
> Projects are being encouraged to share findings with the development of case studies, press releases, blogs, and social media content. Additionally, UKRI are working more closely with Innovate Edge to secure support for business growth and exploitation and making links with their Innovation to Commercialisation of University Research (ICURe) programme.

Recommendations relating to PE Question 2:

> Greater transparency could be provided, regarding the role of Project Director in 'portfolio balancing' and the implications this might have for selection of projects on or around the agreed 70% 'fundable' threshold. Providing this additional transparency may prove a useful mechanism in encouraging applicants to think about the structure and content of their submissions, while more analysis could serve to identify issues or areas where an insufficient number and/or quality of applications are being submitted.

> There may be benefit in providing additional guidance and supporting information where the application requirements diverge from what is commonly asked or expected, with environmental impacts being one example of such a change.

> Further consideration could be given to extending the period of time dedicated to project set-up, where projects can finalise business and delivery plans, design and implement internal processes, and ensure that sufficient resource, via recruitment and secondment, has been secured.

> For Innovate UK KTN, UK CPN and NERC to work collectively in developing a communications strategy to promote the findings and impacts of SSPP to UK and international audiences.

> Related to this, several Project Leads stated that UKRI and SSPP delivery partners could develop a portfolio of events that focus on different aspects of Challenge or the sector. The GRIPS conference is widely viewed as an important and successful event, but like the SSPP Challenge, it covers a lot of issues, and there is limited opportunity for formal and informal networking

> UKRI and delivery partners could establish a schedule of targeted events that focus on specific issues or bring together particular organisations. For example, an event that solely brings together Enabling Research projects or an event targeted at smaller organisations.

6.3 PE3: To what extent have the SSPP Challenge internal monitoring processes and activities contributed to achieving the Objectives of the Challenge?

6.3.1 PE3.1 To what extent did the monitoring of Benefits and Activities, Outputs, Outcomes, and Impacts reflect/capture SSPP progress and activities?

> Some of the SSPP Challenge Team felt that the changes in content, particularly in relation to the focus, aims and objectives of the Challenge, had not been adequately reflected in the benefits.

> For others in the SSPP Challenge Team, there is the belief that targets, and statements contained in the benefits mapping exercise, are not numeric or directly quantifiable, and that achievement/performance against them becomes subjective and based on individual interpretation.

> Further discussions are currently taking place to agree on the overarching purpose of the benefits mapping and to identify more appropriate definitions and SMARTER targets that can be used to monitor performance and achievement.

6.3.2 PE3.2 Was data captured reliably and robustly? Were any issues encountered with data collection?

> The SSPP Challenge Team have very effectively established a proactive approach to project and Challenge level management.

> This approach has cultivated stronger relationships between monitoring officers, Innovation Leads and project leads. This 'relationship management' had encouraged a deeper understanding of individual projects and enabled earlier identification of delivery issues or concerns with underperformance.

> Projects have been highly complementary of the monitoring officers and the relationships that have been developed. Monitoring Officers can spend more time with projects and have greater flexibility and capacity to respond to questions and concerns.

> Mixed views were conveyed about whether performance monitoring and reporting requirements were proportionate to certain projects. Smaller and less experienced companies have struggled with the monitoring requirements, viewing them as overburdensome, and disproportionate to the size of the project they are delivering.
> The SSPP Challenge Team themselves, recognised that their reporting requirements are more extensive, and that the expectations placed on projects are greater than in other challenges.

6.3.3 PE3.3 Has the Challenge's approach to procuring the evaluation in parts, through multiple competitive tender processes, proven to be effective?

> Multiple tenders provide the opportunity for a fresh perspective on how the evaluation can be approached, together with 'built-in' periods of reflection regarding the quality of work completed.
> There are cost and resource implications for UKRI, associated with designing, implementing, and managing each procurement process, and with ensuring each new contractor's familiarisation with the project.

Recommendations related to PE question 3:

> The same flexibility, afforded through multiple procurement rounds, could be achieved through the insertion of break clauses in the contract.
> As part of the planning and preparation for the Phase 3 impact evaluation, we recommend that time is given to reviewing and cutting down the number of indicators used, and the volume of data collected, to keep the burden on applicants to the minimum level required to provide for sufficient evaluation of the Challenge.
> We also recommend further co-ordination of this activity with data being collected separately by UKRI for benefits mapping.
> While wholesale changes to monitoring processes are not on UKRI's or the SSPP Challenge Team's agenda, we would recommend a general review of the indicators and scoring criteria, to make sure they align with the data and evidence available from projects, and that they allow performance to be properly assessed.
> Related to project familiarisation, each phase may benefit from an initial period of 'challenge and discussion', where new evaluators can advise on what may need changing about the approach agreed with the previous contractors.
> Each phase could also benefit from a detailed review of the programme logic and other key documentation, to ensure they remain up to date and relevant, and take account of ways in which the project may have evolved over time.
> UKRI could benefit from ensuring that any appointed contractor has a contractual obligation to consult with the new contractor at the start of the next phase.

6.4 PE4: Has the value created by the Challenge, as a whole, been greater than the sum of its parts? (Principally answered through engagement with projects)

6.4.1 PE4.2 How effective were the various Challenge workstreams in enabling new collaborations and partnerships?

> There was widespread agreement that the SSPP challenge has been effective in developing relationships within and between academic institutions, and between these institutions and the private sector.
> Several project leads stated that completion of the written application necessitated engagement with departments and colleagues that they had not previously engaged with.

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> SSPP has been very supportive is in developing links with private companies that have the financial resources and personnel to progress new products, materials, technologies or designs and take them from the laboratory and into the market.

6.4.2   PE4.3 Is there evidence of synergies between the workstreams?

> Each of the competition workstreams form an important part of the recognised commercialisation process that sees products, processes, and technologies progress from 'proof of concept' and research and development through to use at an industrial or commercial scale

6.4.3   PE4.1 To what extent has the sector, as a whole, been strengthened by the Challenge?

> Several wider stakeholders have referred to 'legacy' and the role that SSPP has played in developing potentially longstanding partnerships between segments of the plastics packaging supply chain that had previously never engaged with one another.
> Through the behavioural projects that SSPP has funded, there is evidence of a clear shift in how consumers view and use plastics. For many, this shift in attitudes is beginning to put pressure on the industry and is forcing them to engage with the issue of problematic plastics

6.4.4   PE4.4 Supporting sustainable solutions

> The question of sustainability sparked an interesting debate, among project applicants, about balancing the need to address plastics already in the waste management ecosystem, with the production and manufacture of biopolymers, aimed at reducing the amount of new plastics entering the supply chain
> These 'reflections' have prompted discussion about what the future focus of SSPP should be, and whether or not there needs to be different challenges that offer more targeted funding in these different areas.