



Evaluation of BBSRC's Follow-on Fund

July 2014

This document represents the views and conclusions of a panel of experts.

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Abbreviations

BBSRC	Biotechnology and Biological Sciences Research Council
BIS	Department for Business, Innovation and Skills
BSC	Bioscience Skills and Careers Strategy Panel
BSI	Bioscience for Industry Strategy Panel
DPFS	Developmental Pathway Funding Scheme
EPSRC	Engineering and Physical Sciences Research Council
ESRC	Economic and Social Research Council
FoF	Follow-on Fund
FTE	Full Time Equivalent
HEI	Higher Education Institution
IP	Intellectual Property
KEC	Knowledge Exchange and Commercialisation
MRC	Medical Research Council
NERC	Natural Environment Research Council
TTO	Technology Transfer Office
SME	Small and medium enterprise

Key Definitions

Knowledge Exchange¹: Knowledge Exchange describes the processes, mechanisms, networks and relationships that enable knowledge derived from research activity to move between organisations. The term is applied to the sharing of knowledge that has potential impact on innovation, and potential to change, transform, enhance or generate new or improved professional practices, policies, technologies, products, services and public perceptions.

Commercialisation²: Commercialisation (which in some contexts is referred to as Technology Transfer) describes the process by which the outcomes of research activity are brought to the marketplace through the development of new products, processes, services or technologies. There will be some kind of commercial return involved in the process relating to the potential value of the assets. The process involves the identification of research which has potential commercial interest and the designing of strategies for how to exploit this research. This will include the protection and management of the rights to intellectual property. The process is typically undertaken by dedicated offices in universities and research institutes and companies. Strategies can include the creation of licensing agreements or joint ventures, partnerships, or spin-out companies.

Translation³: Translational research is defined as research that helps turn early-stage innovations into new products, advancing the innovation to the point where it becomes attractive for further development by industry. It reflects the fact that although academic and company research activity produces many new discoveries and inventions that have the potential to lead to marketable products, this can prove extremely difficult. This might include further work to establish scientific or technical proof-of concept or bring together the right business expertise to develop the product. Translational research addresses these barriers, helping to bridge the gap between basic research and marketable products. It is important to recognise that translational research may not bridge this gap fully. For example, translational research may advance the research outcomes to the point where intellectual property may be exemplified and consolidated, or technology may be brought to a stage at which commercial value can be ascribed to it and its potential defined more accurately. The term translation is primarily applied in the healthcare sectors where routes to application are typically better defined than in other sectors.

Intellectual assets⁴: An asset is an item that has monetary value or which can be used to add value to an organisation. Within the context of BBSRC's KEC policy the term relates specifically to the assets associated with research activity. Some assets are tangible in that they exist physically and have a readily defined value. Other assets are intangible and do not exist physically nor have they a readily defined value. Intellectual capital is defined as the combined value of the intangible assets of an organisation, and will include for example people, technology, knowledge, processes and procedures. Intellectual assets are a key component of intellectual capital, these are the intangible assets that are or can be recorded (or written down, codified etc.). A subset of these assets is intellectual property which will

¹ Adapted from University of Stirling Knowledge Exchange Policy Statement.

² Adapted from PraxisUnico report '*Metrics for the Evaluation of Knowledge Transfer Activities at Universities 2009*'.

³ Adapted from the Wellcome Trust.

⁴ Adapted from Intellectual Assets Centre.

include, for example, technical information, know-how, methodologies, and intellectual property rights such as patents, plant breeders rights, trademarks, copyright, registered designs etc that are legally protected by the statute law.

Executive Summary

This document summarises the views of a specialist Review Panel convened to provide an independent evaluation of the effectiveness and impact of BBSRC's Follow-on Fund (FoF) over the past decade. The objectives of the evaluation were to:

- assess the effectiveness of the FoF in demonstrating the potential of ideas arising from BBSRC-funded research to realise wider benefits through their application
- assess the extent to which the original technical and business plan development objectives of FoF awards were met
- assess the outcomes and achievements arising from the FoF, including any economic and societal impacts
- examine the balance and coverage of the FoF awards
- examine the FoF's application and administration processes

Data for the evaluation were gathered from a number of sources including award final reports, the Research Outcomes System, researcher surveys, BBSRC databases and other publicly available databases.

Key conclusions of the Review Panel

1. The FoF is an effective mechanism for supporting the translation of BBSRC-funded research into practical application

BBSRC's FoF scheme was very successful in supporting the translation of fundamental research funded by the Council. The FoF helped researchers maximise the societal and economic impact of their research outcomes by providing valuable support for the earliest stages of translation projects. It enabled researchers to determine whether their research idea was suitable for further translation and also helped bridge the gap between BBSRC-funded research and the point at which other non-BBSRC funding becomes available. It was unlikely that FoF projects would have achieved a similar level of success without FoF support, especially as there are few alternative sources of funding for this type of activity. The FoF is a vital component of BBSRC's support for knowledge exchange and commercialisation activities within the UK bioscience community and it complements other BBSRC funding mechanisms.

2. The quality of FoF projects was high

FoF projects made substantial progress during the lifetime of the awards. Award holders were generally very successful in meeting their technical objectives and the quality of science conducted was very good. The delivery of projects' business plan development objectives was less successful compared with the technical objectives, but this is to be expected as researchers are less familiar with this type of activity and external factors will influence success. FoF support enabled most researchers to make a clear decision about whether to continue the project after the award ended; both 'stop' and 'go' decisions were successful outcomes for the scheme. The majority of award holders continued to pursue the translation of their research idea after the award ended and

many subsequently made good progress. A small number of projects had not met the expected standard and, for example, were inappropriately focused on research rather than translation or had explored ideas with little chance of being translated. Overall, many more projects than might be expected from such a scheme could be considered as 'successful'. The most successful projects tended to be those that were closer to a commercial end-point at the outset. The interaction between the award holder and their institution Technology Transfer Office (TTO) was also critical for projects' success and the longer-term outcomes.

3. The outcomes and achievements arising from FoF projects were impressive

Researchers pursued a variety of different approaches to translate their research ideas into practical application. Many FoF projects made notable contributions to the development of intellectual property (IP) and a good proportion of these licensed this IP to others. Other projects contributed to the establishment or further development of a spin-out company and, in total, 30 spin-out companies were reported. FoF projects collectively secured an impressive amount of further funding (£46M), around three times the initial BBSRC FoF investment (£15M). The projects also contributed to a variety of other good outcomes and achievements (e.g. collaborations and partnerships, publications, training and skills development). However, the Panel identified a need to improve the FoF scheme's reporting mechanisms to capture the longer-term outcomes and impacts that arise after the end of the award.

4. There is strong potential for FoF projects to deliver economic and societal benefits to the UK

It often takes a substantial period of time for bioscience research to be fully translated and many projects were still actively seeking to translate their research idea. There were clear examples of FoF projects that had strong potential to deliver economic and societal benefits, and a few projects had already done so. Examples of areas where the FoF had made, or had the potential to make, contributions to the wider public good included animal health, animal welfare, biotechnology, the environment and mitigating climate change, food security and sustainable agriculture, industrial biotechnology, and human health. There were also examples of positive outcomes associated with commercial partners' use of the innovations developed through FoF project (e.g. job creation, increased sales, international exports).

5. The balance and coverage of the FoF portfolio is broadly appropriate, but there are some issues which should be addressed

The FoF had supported a variety of projects from across the BBSRC remit and there was reasonable alignment between the coverage of the FoF and BBSRC research grant portfolios. There was a welcome increase in BBSRC's investment in the FoF over the evaluation period and the current level of support of around 2% of the research budget was appropriate. The FoF had attracted and supported applications from researchers with a variety of previous experience with translational research and the support for researchers with no previous experience was particularly encouraging. However, there were some concerns with the overall balance of the portfolio. Projects related to health were overrepresented and some appeared to support activities which were outside the BBSRC remit. There is a need for more explicit guidance on the types of activities

BBSRC will support in terms of the Council's remit, the duration of the support, and how this might vary by sector. There are also some types of project that should not be supported by BBSRC (e.g. drug target identification). There are opportunities for BBSRC to develop a greater 'portfolio view' of the FoF and, in particular, manage the links between similar projects more closely.

6. Pathfinder awards are a useful component of BBSRC's support for translation activities

The Pathfinder scheme was used effectively to support the earliest stages of translational research. Pathfinder awards were primarily used to support market assessments but some technical development was also funded. About half of Pathfinder awards were associated with a subsequent FoF application. There was no evidence that Pathfinder award holders had increased success rates for subsequent FoF applications compared with other researchers. However, it was likely that the market assessments and external advice commissioned through the Pathfinder scheme benefited the delivery of associated FoF projects. The Pathfinder scheme achieved its major objective of putting researchers in a position to apply for a FoF award. It was also pleasing that the funding was also used in a flexible manner to support other stages of the translation process.

7. The Follow-on Fund application and assessment processes are effective

The FoF had attracted a good number of high-quality applications. The scheme's application success rate was higher than for BBSRC research grant applications, which is welcome and appropriate. There were several examples of good practice associated with the FoF application and assessment processes (e.g. light-touch process, breadth of expertise on the FoF Committee). Moreover, the support provided to applicants by BBSRC staff who manage the scheme was very good and contrasts with other Research Council funding programmes where personal contact between Research Council staff and researchers has diminished because of the transfer of functions to shared services. The responsive nature of the FoF funding mechanism was also a strength of the scheme.

8. The FoF has developed considerably over the evaluation period

BBSRC had adapted the FoF scheme over the evaluation period to ensure it remained fit for purpose. The introduction of Pathfinder and Super FoF awards was welcome and these additions further improved the support available to researchers. The Council also developed a clearer understanding of the types of project that should be supported over time. In addition, it broadened the scope of scheme, so that projects that would primarily realise societal benefit were eligible. The continued development of the FoF scheme was encouraging and it is important that this is maintained in the future.

9. There are opportunities to improve the FoF scheme further

In general, the FoF scheme was operating very well but there were a number of aspects which could be improved. The standard FoF award duration limit was often not sufficient to enable projects' objectives to be completed and BBSRC should consider increasing this beyond the current 12 month maximum. The limited provision for mentoring was a

notable gap within the scheme and BBSRC should expand its support for this activity. There were also opportunities to improve the application and assessment processes. For example, BBSRC should explore alternative models for the FoF Committee to increase the relevant level of expertise used to review each application. It should also place greater emphasis on the interactions between FoF award holders and TTOs as part of the assessment process, as these interactions can be essential for a project's long-term success. In addition, although it was encouraging that the FoF was adopting a higher level of risk than equivalent private sector funding, there was probably scope for the FoF to be riskier.

10. There is a need for BBSRC to work more closely with other funders to support the translation of research outcomes

It is essential that BBSRC works with other funders to maximise the opportunities to deliver wider benefits from publicly funded research. There are opportunities for greater cooperation between BBSRC, other Research Councils, the Technology Strategy Board and other major funders (e.g. the Wellcome Trust). In particular, it is important that there are no gaps between the remits of individual Research Councils or the activities they support. Although BBSRC made good progress over the evaluation period to strengthen its links with other Research Councils and develop a shared understanding of the support for translation activities, there are still areas where the responsibilities of individual Councils are not clear.

11. It is unlikely that the FoF investment would have achieved a similar level of success through a devolved funding model

Recently, some Research Councils have made changes to their funding mechanisms which support the translation of research, devolving significant aspects of the support to individual institutions. There would be advantages and disadvantages if BBSRC devolved its FoF funding to institutions. On balance, however, BBSRC should retain the FoF scheme and manage it directly. There are clear benefits in BBSRC retaining close ownership of its translation funding. It provides greater assurance that the funding is used to support the best projects and helps the Council drive culture change at the institutions in which it invests. It also enables the Council to be more responsive to emerging developments and consider the wider UK interest alongside the local, institutional drivers when deciding which projects to support. BBSRC should nevertheless examine whether there are particular aspects of its support for translation activities that could be devolved. For example, there may be opportunities to devolve Pathfinder funding where institutions have a track record of using this funding effectively.

12. BBSRC should continue to invest in the FoF scheme

The FoF is a critical component of BBSRC's support for translation activities and without it many opportunities to deliver benefit from BBSRC-funded research would be lost. By investing in the earliest stages of translation projects, the FoF is addressing a market failure in the UK innovation ecosystem. It is supporting activities that would not be funded elsewhere within the public and private sectors. Moreover, it is reducing the risks to future investors by identifying which research ideas are suitable for further development. The FoF is providing effective support to enable the translation of BBSRC research ideas into practical application. It is also delivering wider benefits, for example, encouraging culture change within institutions and enabling researchers to gain

important skills and experience with translation. It is essential that BBSRC continues to invest in the FoF scheme and, more generally, translation research activities. The scheme adds substantial value to the outcomes of BBSRC-funded research and will ultimately produce economic and societal benefits for the UK and beyond.

1. Introduction

1.1 BBSRC

1. The Biotechnology and Biological Sciences Research Council (BBSRC) is one of seven Research Councils funded through the Department for Business, Innovation and Skills (BIS) of the UK government. Its principal aim is to foster a world-class biological science community in the UK. The mission of BBSRC is to fund internationally competitive research, to provide training in the biosciences, to encourage opportunities for knowledge exchange and impact, and to engage the public and other stakeholders in dialogue on issues of scientific interest. BBSRC's Strategic Plan⁵ describes the research priorities and enabling themes that drive the Council's investments.

1.2 Evaluation context

2. BBSRC is committed to the effective evaluation of the research, training and capability it funds, as part of its strategy for evidence-based decision making. Evaluation plays a central role in:
 - enabling BBSRC to account to government, the public, the scientific community and other stakeholders for the funds it allocates
 - justifying BBSRC funding allocation and contributing to the evidence that all Councils are required to submit to BIS
 - informing internal funding decisions, providing evidence of progress and achievement, and facilitating the development of a strategic overview for future funding decisions
 - helping BBSRC to improve its policy and practice, through informing policy decisions and the design of new schemes, programmes and processes; and through identifying good practice, lessons learned and ways to improve processes

BBSRC's Evaluation Framework⁶ outlines the Councils approach to evaluation and the methodology used.

1.3 Knowledge Exchange and Commercialisation

3. BBSRC has a responsibility to enable the optimal and successful application of the research it funds, to ensure the widest benefit to society and the economy both within and beyond the UK. Fundamental to this position is BBSRC's commitment to ensuring that research outcomes are translated so as to deliver direct and indirect benefits to individuals and organisations.
4. BBSRC's Knowledge Exchange and Commercialisation (KEC) strategy is designed to enable and incentivise a wide range of knowledge exchange, translation and commercialisation activities both directly through BBSRC funding schemes and indirectly in partnership with other organisations⁷. BBSRC recognises that the delivery

⁵ www.bbsrc.ac.uk/strategy

⁶ www.bbsrc.ac.uk/researchevaluation

⁷ BBSRC's KEC policy describes the principles underlying BBSRC's position:
www.bbsrc.ac.uk/web/FILES/Policies/knowledge-exchange-commercialisation-policy.pdf

of benefit from the research, training and capability in which it invests is a complex, non-linear process. As such, the Council supports a variety of funding mechanisms to enable the research community to work with industry, government and others to harness business opportunities and deliver economic and societal impact from their research outcomes⁸.

1.4 Introduction to the Follow-on Fund

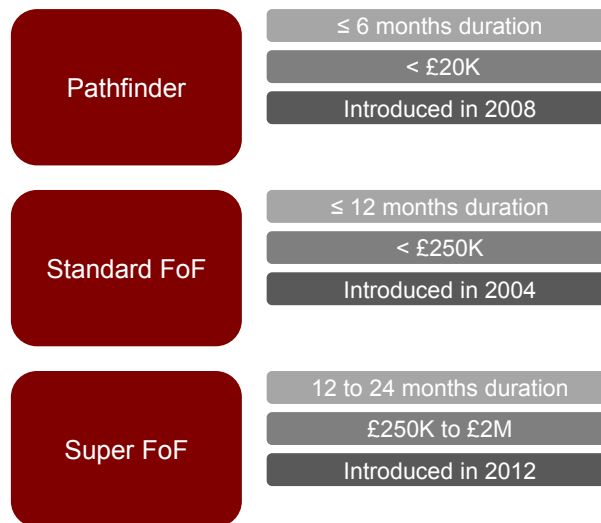
5. BBSRC's Follow-on Fund (FoF) scheme is designed to support the translation of fundamental research funded by the Council into practical application, including commercialisation⁹. The aim of the programme is to help researchers maximise the societal and economic benefits of their research. The FoF is a proof-of-concept model where further work on an idea will take it through to a stage at which the route to application is clear, which may include a spin-out or licensing opportunity. The programme enables researchers to conduct activities essential to preparing a robust business plan and to secure, where appropriate, further funding and support to progress the project.
6. BBSRC currently supports three types of award through the FoF programme:
 - **Standard FoF awards:** to enable researchers with a sound understanding of the market opportunity of their intellectual assets to execute a defined programme of work of up to a year in length that has clearly defined complementary technical and business plan development objectives
 - **Super FoF awards:** similar to standard awards, but providing longer and more wide-ranging support
 - **Pathfinder awards:** to help researchers better understand their proposition and the potential route to application.
7. Since the scheme's inception in 2004, 146 standard and Super FoF awards have been supported with a total BBSRC investment of £17.9M¹⁰.
8. A key objective of the FoF is to address a widely perceived market failure within the UK innovation landscape. Research outcomes arising from BBSRC-funded research have potential to deliver wider benefits to society and the economy. However, projects to translate these research ideas into practical application are often unable to secure funding from the private sector or other investors; the projects are considered to be at a too early a stage or too risky to attract investment. Without FoF support (or other public funding), the projects may not proceed and the opportunity to realise wider benefit from BBSRC's previous investment in the research would be lost. The FoF aims to bridge the funding gap between BBSRC-funded research and the point at which other non-BBSRC funding becomes available. By supporting early-stage projects, it also seeks to reduce the risk for future investors. The FoF should not duplicate other sources of public and private funding.

⁸ www.bbsrc.ac.uk/business/business-index.aspx

⁹ www.bbsrc.ac.uk/business/commercialisation/follow-on.aspx

¹⁰ Data are for the 2004 to 2012 calls only. Data include standard FoF and SuperFoF awards with start dates from 1 April 2004 to 8 Aug 2013. Pathfinder awards are not included.

Types of Follow-on Fund award



All awards provide support at 80% of full economic cost (fEC). The application and assessment processes differ vary between the three types of award (further details are available on the BBSRC website).

1.5 Evaluation methodology

9. Information for the evaluation was gathered from a number of sources:
- **former FoF award holders:**
 - 113 completed awards, covering 105 individual projects
 - 111 award final reports
 - 75 survey responses from a sample of 100 former award holders (75% response rate)
 - all of the completed awards were standard FoF awards
 - **current FoF award holders:**
 - 20 survey responses from a sample of 23 current award holders (87% response rate)
 - 18 of the current awards were standard FoF awards, 2 were Super FoF awards
 - **FoF applicants:**
 - 78 survey responses from a sample of 145 researchers who applied for a FoF award which was not subsequently funded (54% response rate)
 - **Knowledge exchange professionals**
 - 7 written responses from staff at Technology Transfer Offices (TTOs) or equivalents
 - updates on 5 completed standard FoF awards
 - **BBSRC data:** relevant data were collated from award final reports, the Research Outcomes System and other BBSRC databases
 - **other public data:** relevant data were collated from other publicly accessible databases (e.g. Web of Science, European Patent Office Espacenet)

The questionnaires sent to researchers are reproduced at Appendix 3 (p. 57). The survey responses were received between August and October 2013.

10. The evidence collected for the evaluation was reviewed by a panel of experts who are familiar with knowledge exchange and commercialisation activities and who between them have expertise or awareness across the BBSRC remit. The Review Panel membership is at Appendix 2 (p. 57). The Panel met in January 2014.
11. The majority of data presented are for standard FoF awards. Where the data refer to Super FoF or Pathfinder awards, this is noted in the text. Pathfinder award holders were not contacted specifically for this evaluation. As many Pathfinder award holders subsequently applied for standard FoF support, their views on the Pathfinder scheme were captured through the FoF award holder and applicant surveys.
12. Some researchers received more than one FoF award to support their project. In general, the outcomes data in this report are presented with reference to individual projects rather than awards (i.e. multiple FoF awards for the same project are not considered separately).

2. Project performance

Summary

- the overall performance of the FoF portfolio was impressive
- the quality of projects within the FoF portfolio was generally high, with only a small proportion not meeting the expected standard
- the FoF enabled researchers to determine whether their research idea was suitable for further translation
- many FoF projects made substantial progress after the award ended
- interactions between the award holder and the host institution TTO are critical for success
- the projects would not have achieved a similar level of success without FoF support
- the provision for mentoring is too limited within the FoF scheme
- there is scope to improve the longer-term reporting of the outcomes and achievements of FoF projects

2.1 Context

13. The FoF is a proof-of-concept model where further work on an idea will take it through to the stage at which the route to application is clear. The FoF enables researchers to explore whether an idea is suitable for further translation, but there is no expectation that all projects should identify research ideas that could be developed further. There will be significant attrition as projects progress and, ultimately, only a small proportion of ideas are likely to be fully translated into practical application. In this respect, the FoF is distinct from other BBSRC investments (e.g. responsive mode) and more similar to venture capital funding. It is important to consider the success of the scheme in this context.
14. The nature of the FoF funding model means that the scheme's measures of success are varied and complex. The Panel considered several factors when reviewing the performance of FoF projects, including the extent to which:
 - the original objectives of the project were met
 - the project enabled a clear decision to be reached on whether the research idea was suitable for translation into practical application
 - where appropriate, the translation of the research idea progressed after the award ended
 - the project was within the spirit of the scheme (i.e. focused on the translation of the research idea vs. extending responsive mode research)
 - the project took account of previous developments
15. It often takes a substantial period of time for bioscience research ideas to be translated into practical application. For the majority of FoF projects, the development of the research idea was still in progress and the ultimate outcomes were unknown. As such, the Panel's assessment was often based on the potential of the project to deliver future benefits to society and the economy.

16. The data in this chapter provide an overview of the project performance during the award and any progress after the award ended. Details on the specific outputs, outcomes and achievements arising from FoF projects are provided in Chapter 3 (p. 25).

2.2 Progress during the award

17. The standard of FoF projects was high and substantial progress was made during the lifetime of the awards. Researchers were very positive about their progress in their final reports and the subsequent survey self-assessments, with a majority stating that they had met their project's technical and business plan development objectives^{11,12}. There was inevitably some tendency for award holders to overstate the success of their project, however.
18. Award holders were generally very successful in meeting their technical objectives and the standard of the science conducted was very good. A small number of projects experienced issues which limited their success in meeting the technical objectives; this is to be expected, especially when researchers are exploring the feasibility of higher-risk ideas.
19. The delivery of projects' business plan development objectives was less successful compared with the technical objectives. It is important to note that researchers are less familiar with this type of activity and external factors outside the researchers control will influence success. Overall, the proportion of projects that successfully delivered their business plan development objectives was good and appropriate. Nevertheless, there was scope for further improvement and BBSRC should consider whether to provide award holders with relevant mentoring as part of standard FoF awards (see section 2.7). Many award holders underestimated the challenges associated with their project's business plan development objectives, which were often too ambitious to complete within the 12 month duration of the project. Nevertheless, the majority of researchers managed the links between the technical and business plan development objectives effectively.
20. There were clear examples of good practice within the FoF portfolio. Commercial input often made a very positive difference to the eventual outcomes and it was pleasing that award holders were responsive to industry involvement and had commissioned external advice, where appropriate. It was also reassuring that researchers were responsive to regulatory issues that could affect the eventual translation of their research idea into practical application.

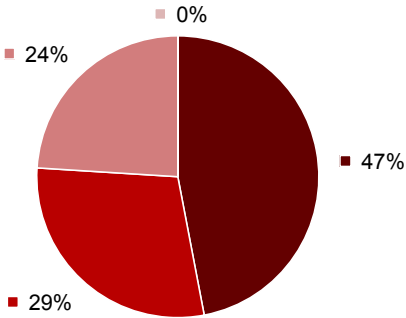
¹¹ FoF projects have two major types of complementary objectives:

- **technical objectives:** e.g. scientific and technical development of the idea, undertaking further research
- **business plan development objectives:** e.g. improving an intellectual property position, gaining further information about the market, identifying potential licensees etc.

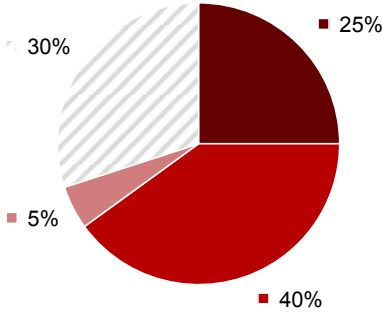
¹² BBSRC expects all FoF projects to develop a robust and clearly defined business plan, irrespective of the approach chosen to translate the research into practical application.

Award holders' self-assessment of the performance of their project in meeting its technical and business plan development objectives

Technical objectives

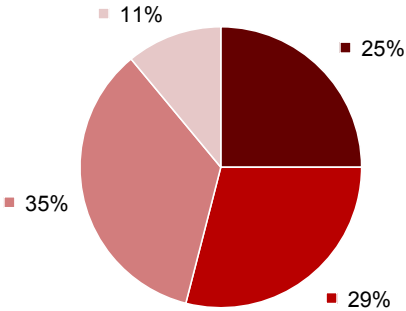


Former award holders

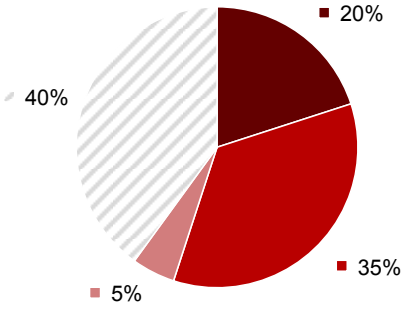


Current award holders

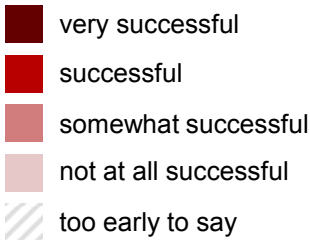
Business plan development objectives



Former award holders

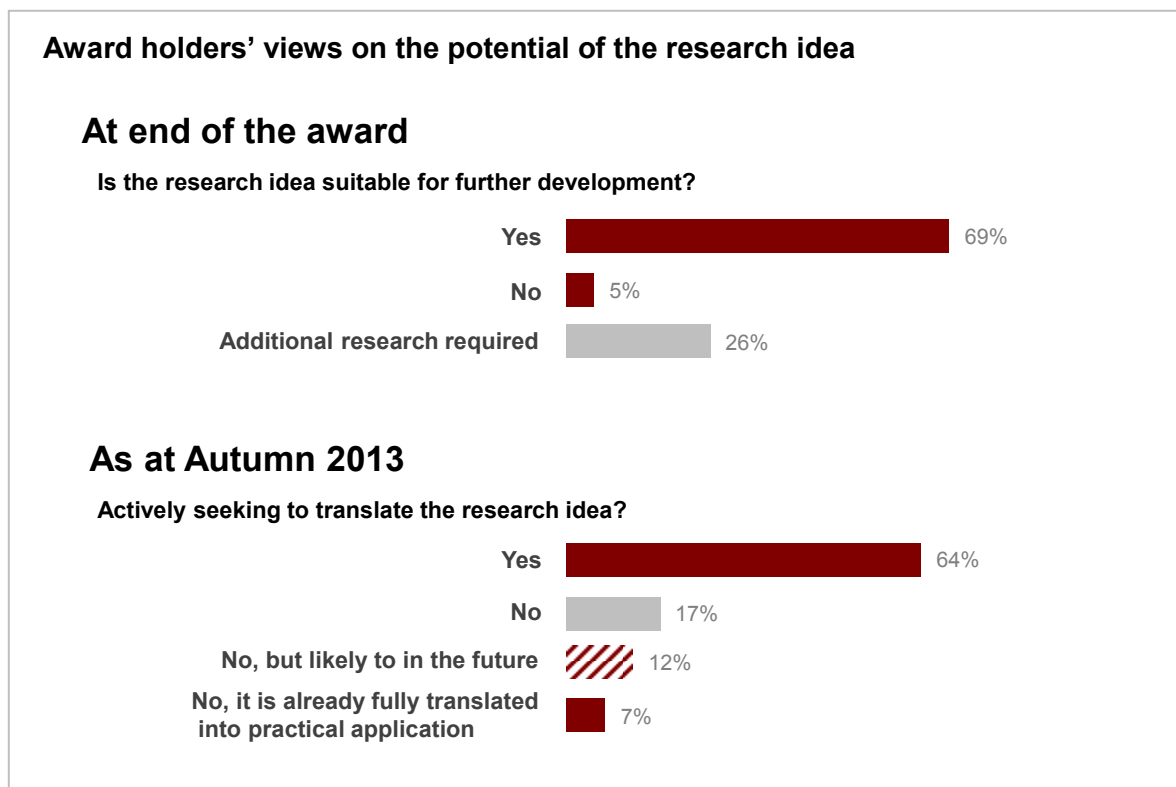


Current award holders



2.3 Project status at the end of the award

21. The FoF was successful in enabling award holders to determine whether their research idea was suitable for translation. 86% of former award holders stated that the potential for the research to be translated into practical application was clear at the end of the award.
22. The majority of award holders indicated that their idea was suitable for further translation, which was a positive outcome. By supporting the initial stages of the research idea's translation, the FoF reduced the risk to future investors and helped to address the market failure which can limit the delivery of wider benefits from BBSRC-funded research. Conversely, a small proportion of researchers stated that their idea was not suitable for further development. This was also a positive outcome as it prevented further time and resources being invested into pursuing the idea. It is important that BBSRC highlights both these types of outcomes as examples of success in any guidance and publicity material for the FoF scheme.



2.4 Further development of the project's research idea

23. Many award holders had made good progress after their award ended and the majority were actively seeking to translate their research idea into practical application as at the time of the evaluation surveys (Autumn 2013). The proportion of projects that were still active was higher than anticipated, especially considering that the failure rate for these activities is typically very high.
24. 88% of award holders indicated that the status of their project's research idea or technology had developed between the time of the FoF application and the end of the

award. 60%¹³ of award holders stated that the status of their project's research idea or technology had developed since the end of the award and Autumn 2013. Overall, 91% of award holders stated that their project's research idea had developed since the time of the FoF application and Autumn 2013.

25. A small proportion of FoF projects had successfully translated the research idea into practical application. These projects represent excellent outcomes for the FoF scheme. However, for many projects, it was too soon to assess their eventual outcome. Progress to date was encouraging and there were examples of exciting projects within the portfolio that had strong potential to succeed. To date, the most successful projects appeared to be those that were closer to a commercial end point at the outset. Projects that focused on technology and methodology development were also very effective.

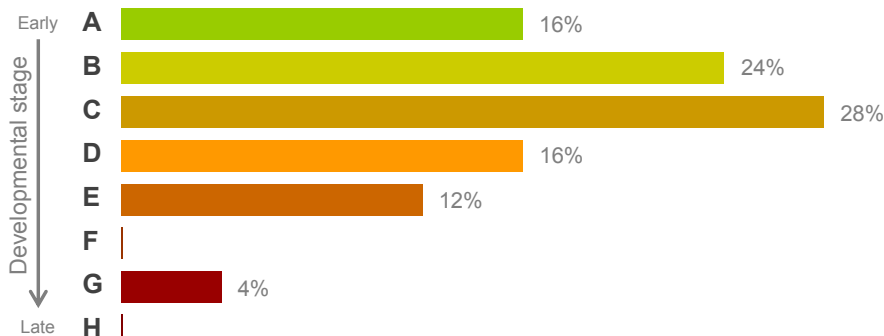
2.5 Interactions with the Technology Transfer Office

26. Interactions between the award holder and their institution's Technology Transfer Office (TTO) or equivalent can be critical for a FoF project's success. TTOs can provide valuable support and expertise to assist the delivery of a project's business plan. Moreover, as projects develop, they are likely to reach a stage where future progress is driven by the TTO rather than by the award holder. In general, projects where there was good, ongoing engagement with the TTO appeared to be more successful.
27. It was difficult to assess the interactions between FoF award holders and TTOs from the limited information available. There were reports of excellent interactions where the TTO was very helpful and supportive during and after the award. However, there were also reports of tensions between academics and the TTO, or poor interactions where researchers were not provided with the required support. On balance, the level and quality of TTOs support for FoF award holders was probably lower than expected. BBSRC should place greater emphasis on the proposed interactions between the academic and TTO as part of the FoF application assessment process, considering both support during the award and after it ends.
28. TTOs have limited resources and are likely to be overstretched. It is unrealistic to expect TTOs to have specific expertise in all bioscience-associated industry sectors. In addition, there may be limited scope for TTOs to adjust their standard commercialisation models to fit the needs of individual FoF projects. BBSRC should consider whether it could provide additional support for TTOs within the FoF scheme, for example, by providing access to expertise in specific bioscience sectors. BBSRC should also consider covering the costs of TTO staff as part of FoF projects (e.g. at 0.1 to 0.2 FTE). This would ensure that FoF projects received dedicated support from the TTO and that award holders had access to TTO staff time. It would also enable institutions with smaller TTOs to 'buy in' relevant expertise to support FoF projects (e.g. from another institution).

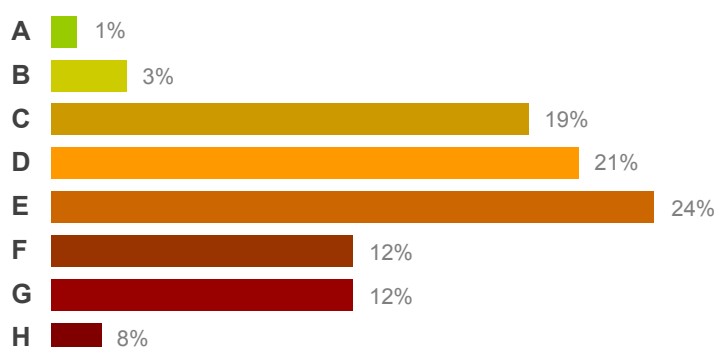
¹³ The data do not include the 8% of award holders who indicated that their idea of technology was ready to market or available to end-users at the end of the award.

Status of the research idea at different stages of the project

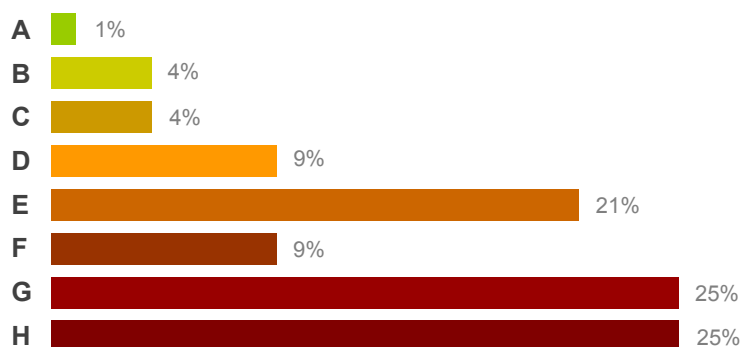
At the time of the FoF application



At the end of the award



At present (i.e. Autumn 2013)



- A:** I had an idea from a previous project, but had not conducted any research to develop it further
- B:** I was conducting basic research to develop the idea / technology
- C:** I was conducting research to prove the feasibility of the technology (e.g. applied research)
- D:** I had prove feasibility and was developing the idea / technology
- E:** I had demonstrated the usefulness of the idea / technology with the laboratory (e.g. prototype)
- F:** I had demonstrated the usefulness of the idea / technology within a real world test
- G:** I had demonstrated the usefulness of the idea / technology and was developing further refinements
- H:** The idea / technology was ready for market or available to end-users

Data show the proportion of award holders. Data are based on self-assessments and should be interpreted with caution. Award holders often selected more than one option for each stage of the project. For this analysis, only the option furthest along the development scale was used. Some award holders did not select any option for the 'end of the award' or 'at present' stages. For these projects, the option selected at the previous stage was used to complete any missing data. Some award holders also appeared to overstate their research idea's stage of development.

2.6 Projects which did not meet the expected standard

29. A small proportion of projects did not perform as well as expected and there were a few projects that should not have been funded. For example, a small number of projects had a strong research focus and were primarily extensions of responsive mode research with little consideration towards developing a business plan to translate the idea into practical application. These projects were mainly funded early during the evaluation period, when the aims of the scheme were less clearly defined. Such projects would not be funded through the scheme today.
30. In addition, a small number of FoF projects explored ideas that had little chance of being translated into practical application. These projects would have benefited from greater commercial due diligence as they often failed to recognise where similar research had already been undertaken by industry and had not been successful. Examples included projects on anti-sense drug development and target validation (e.g. for pharmaceuticals or herbicides). BBSRC should amend the FoF assessment process so there is more engagement with the relevant industry sectors. This would help ensure that supported projects will subsequently be attractive to industry and have a route for translation.

2.7 Mentoring

31. There is no provision for award holder mentoring within standard FoF awards, although this can be provided as part of Super FoF awards on a case-by-case basis. The limited provision of mentoring is notable gap within the FoF scheme and BBSRC should consider expanding its support for this activity. Award holders may lack the expertise associated with the delivery of their project's business plan development objectives and mentoring may improve the project performance. The emphasis of any mentoring provision should be project-specific support, rather than generic training for award holders.
32. It is recognised that providing support for mentoring would increase the cost of the FoF scheme. If additional funding is not available, BBSRC should consider covering the costs by lowering the success rate for Pathfinder awards (see section 5.X) or reducing the number of FoF awards supported (e.g. see sections 2.6 and 4.X). The focus of the scheme should remain the translation of research into practical application rather than the development of entrepreneurial individuals. However, these two objectives are not mutually exclusive.

2.8 End of award reporting and longer-term monitoring

33. Over the evaluation period, FoF award holders were required to submit a final report at the end of the award. In October 2013, BBSRC withdrew its requirement for final reports for all its funding schemes, as a move to harmonise further with other Research Councils. Award holders are now expected to provide information on the outcomes and achievements of projects through a cross-Council outcomes reporting system¹⁴.

¹⁴ RCUK are implementing a harmonised research outcomes system which will utilise a common data model across the seven Research Councils. In June 2014, RCUK announced that the Researchfish system will be used by all Research Councils to collect outcomes data from September 2014.

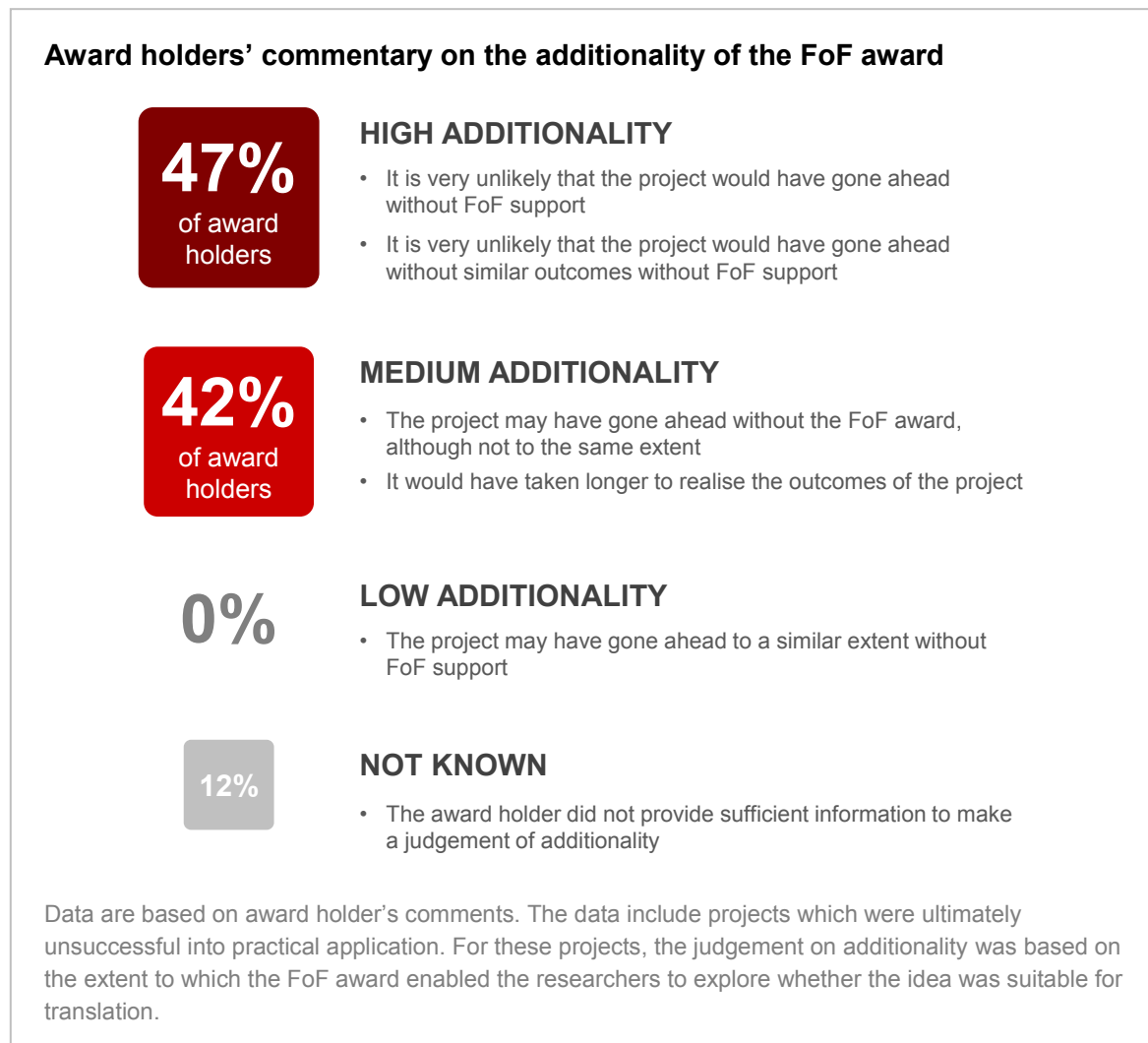
34. The quality of final reports submitted by FoF award holders was variable. Many reports were good and provided a clear description of progress to date and the intended future directions. However, others were unsatisfactory and, for example, did not address the project's objectives or were too focused on academic outputs. Other award holders overstated their progress or underestimated the future challenges to develop their idea and business plan. It is important that award holders are realistic in their reporting and it was noted that the pressure to deliver could make researchers over optimistic.
35. There were advantages of using a final report that was tailored specifically for the FoF and that reflected the distinctive aims of the scheme. It provided award holders with a clear understanding of the expected outputs of the FoF award and where these differed from other BBSRC funding (e.g. less emphasis on academic publications). Moving forward, it will be important to develop specific guidelines about how award holders should use a cross-Council outcomes collection system to report the outcomes of their FoF award. Reporting against individual project objectives is very valuable and must be retained.
36. The FoF aims to help researchers maximise the societal and economic benefits of their research. As these benefits are likely to arise in the longer-term, to determine the success of the scheme it is essential to capture any outcomes and achievements that arise after the award ended. Over the evaluation period, the mechanisms for capturing the longer-term outcomes of the awards were limited and those that were available were not widely used. This is a weakness with the scheme, although in the future there will be greater scope for capturing progress after the award ends through a cross-Council outcomes collection system.
37. BBSRC should consider who has responsibility for reporting FoF project outcomes after the end of the award and amend the award terms and conditions accordingly. It may be more appropriate to require the TTO to provide updates on the project's outcomes; award holders are likely to become less closely associated with the project over time and may not have access to the all relevant information. As projects progress, further development is likely to be driven by the TTO. Moreover, the host institution will derive significant value from the project's success and the original FoF investment (e.g. through ownership of IP, licenses, equity etc.). It is important to ensure that there are appropriate incentives to complete the reporting.
38. Research Councils are now making the outcomes of their research investments publicly accessible through the Gateway to Research website¹⁵. In this context, it is important that the outcomes of FoF projects where the research ideas were not suitable for further translation are also reported. This can help reduce duplication of effort and prevent resources being used pursuing ideas that will not be successful.

2.9 Additionality of the FoF

39. Additionality can be defined as the net positive difference that results from a specific intervention. The Panel considered the additionality of the FoF scheme to be relatively high. It was unlikely that the supported projects would have realised similar outcomes without the FoF investment (i.e. the extent to which the projects would have taken place at all, or as quickly, or to a similar quality). The outcomes of projects from FoF applicants who were not funded also supported this view. While a few applicants had achieved significant success without FoF support, most had struggled to obtain an

¹⁵ For details see: <http://gtr.rcuk.ac.uk>

alternative source of funding that enabled them to make substantial progress with their project.



2.10 Overview of project performance

40. Overall, the performance of the FoF portfolio was impressive. The Panel estimated that approximately half of all projects should be considered as 'successful', which was a higher proportion than anticipated. It should be noted that this figure does not represent the proportion of projects that will eventually translate their research idea into practical application. Instead, it includes the different facets of success within the FoF scheme (e.g. projects that met their original objectives; projects that enabled a clear 'stop / go' decision at the end of the award; projects that made good progress after the award ended; projects that achieved positive commercial outcomes). The strong performance of FoF projects demonstrates that the scheme is an effective mechanism for supporting the translation of research ideas into practical application, although there remains scope for further improvement.

3. Outcomes and achievements

Summary

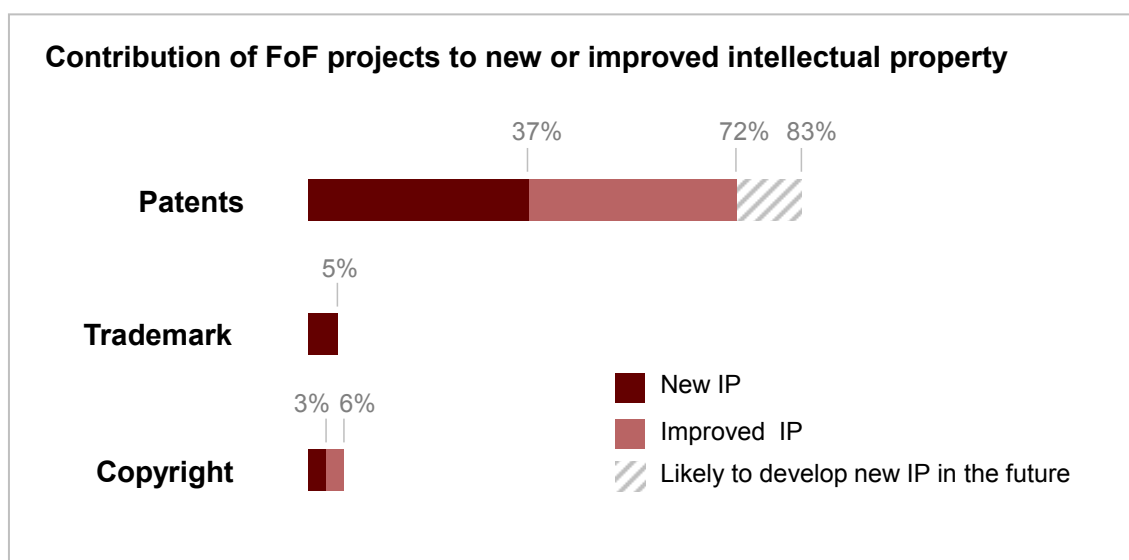
- the outcomes and achievements arising from FoF projects were very good
- the projects made notable contributions to the development of IP and a good proportion of projects licensed this IP to others
- the projects contributed to the establishment or further development of 30 spin-out companies
- the projects attracted an impressive amount of further funding, which was approximately three times the initial BBSRC investment
- many award holders were making good progress with translating their research idea into practical application
- there is strong potential for projects to deliver economic and societal benefits in the future

3.1 Context

41. A major objective of the FoF is to enable researchers to identify the most appropriate route for translating their research ideas into practical application. The specific mechanisms used to translate the research may vary considerably between individual projects (e.g. licensing, spin-out, collaboration with an existing business, social enterprise). This chapter provides an overview of the outcomes and achievements arising from FoF projects. There is no expectation that individual projects will produce outcomes relevant to all the different outcome types described below.
42. The outcome types described are indicators of success for those FoF projects which determined the research idea was suitable for further translation. They may not be appropriate or relevant for projects that determined the research idea was not suitable for further translation.
43. Some of the outcomes and achievements of BBSRC's investment in the FoF are likely to arise in the medium and longer-term. As such, many of the outcomes from individual projects are still pending, particularly if the FoF award ended relatively recently. While outcomes reported by award holders were attributable to the FoF award, any outcomes arising after the award ended may also be attributable to other sources of funding. The data presented are for former award holders only.

3.2 Intellectual property

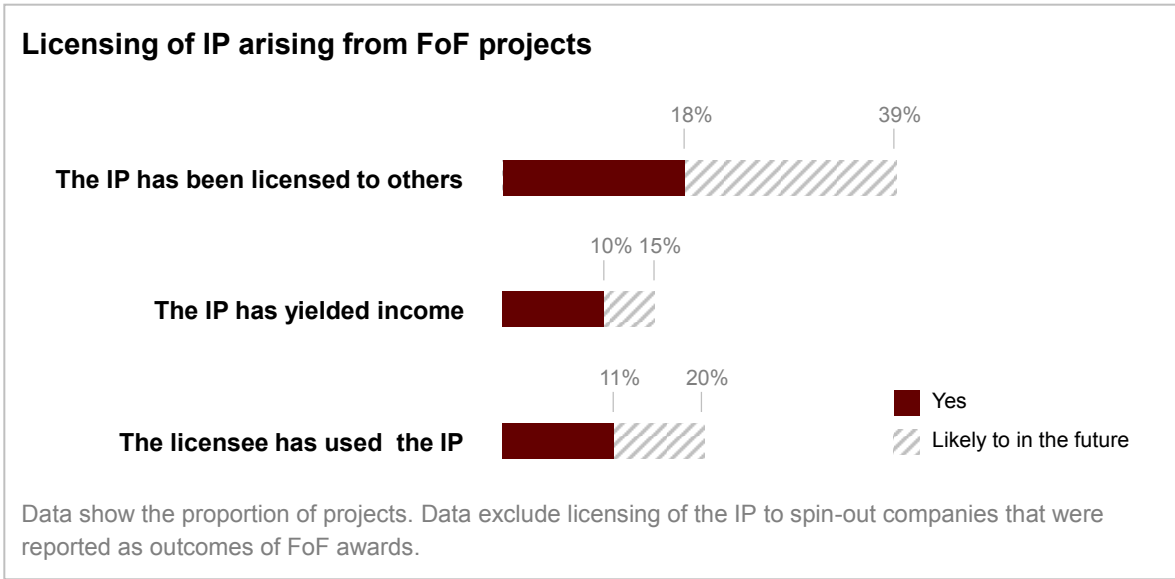
44. A high proportion of award holders (74%) indicated that their project contributed to new or improved intellectual property (IP) such as a patent, trademark or copyright, and others indicated that it was likely to do so in the future. Patents were the most common type of IP produced. Most patents were still maintained and about one third had been awarded to date. However, for the majority of patent applications the decision on whether to award the patent had not yet been made.



45. This number of patent applications was good and met expectations, given the nature of the scheme. It was encouraging that FoF projects had also added value to existing patent applications, generating data which strengthened or exemplified the original application. It is important that award holders consider carefully whether and / or when to patent their research ideas; there were examples of both over-patenting and under-patenting within the portfolio. BBSRC should be cautious about using patent applications as a key indicator of success for the FoF scheme as this is likely to create inappropriate incentives.

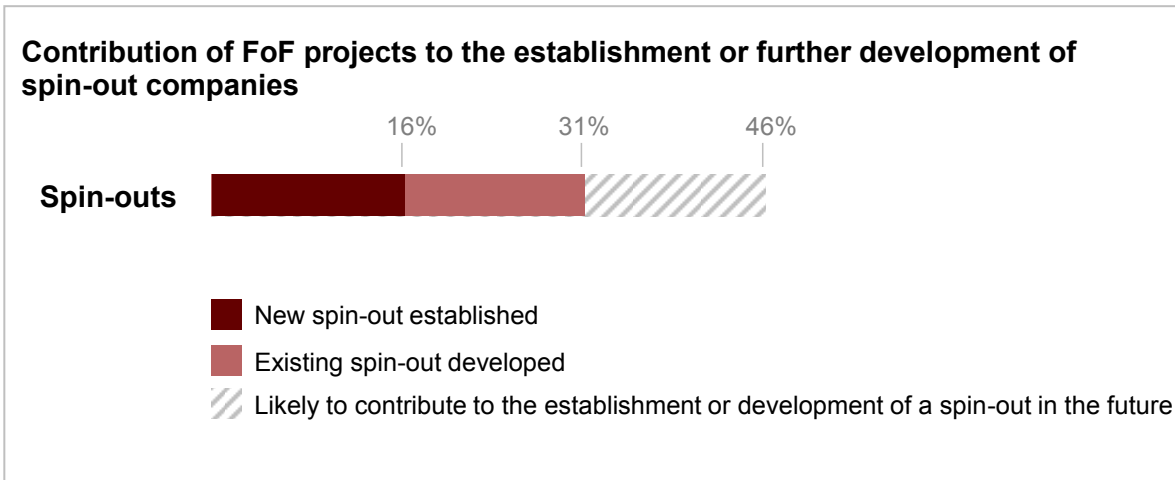
3.3 Licensing of intellectual property

46. 18% of award holders reported that they had licensed their IP to others and a similar proportion were likely to do so in the future. At least twenty companies had licensed IP arising from FoF projects, including multinational companies and small and medium enterprises (SMEs), and there was representation from a variety of sectors: aquaculture, agriculture (animals and crops), food, health and pharmaceuticals, and the manufacture of supplies and reagents for the life science industry. There was limited information on the amount of licence income generated by the projects to date; £801K income was reported, but this was likely to be an underestimate. The data on IP licensing were encouraging. They demonstrated that FoF projects were delivering outcomes that were valuable to others and that the ideas were moving closer to translation.



3.4 Spin-out companies

47. An impressive proportion of projects (31%) contributed to the establishment or further development of a spin-out company and, in total, 30 spin-out companies were reported. A high proportion of these companies (80%) were associated with the health and pharmaceuticals sector, with only limited representation from other sectors. A good proportion were of companies were still active three and five years after incorporation¹⁶, and 20 were active at the time of the evaluation surveys. Many had attracted further investment (see section 3.6). Employment data were available for 12 of the active companies; in total, these companies employed 85 staff.
48. It was clear that the FoF was making a valuable contribution to the development of spin-outs from BBSRC research. Other analyses had previously identified 71 spin-out companies that were highly-attributable to BBSRC investments. The 30 FoF-attributable companies accounted for 42% of this total, which was substantial.



¹⁶ 18 out of 23 (78%) companies were active three years after their incorporation. 15 out of 18 companies (83%) were active five years after incorporation.

Spin-out companies that are attributable to FoF investment

Company name	Incorporated	Status	Sector
a2sp	2006	Dissolved ¹	Health and Pharmaceuticals
Absynth Biologics	2006	Active	Health and Pharmaceuticals
Attomarker	2008	Active	Health and Pharmaceuticals
BioMoti	2009	Active	Health and Pharmaceuticals
Celltran	2000	Dissolved ²	Health and Pharmaceuticals
Cepos Insilico	2004	Active	Other
Chameleon Biosurfaces	2001	Dissolved ³	Health and Pharmaceuticals
C4DXDiscovery (formerly Conformetrix)	2007	Active	Health and Pharmaceuticals
Curapel	2011	Active	Health and Pharmaceuticals
Degrasense	2008	Dormant	Health and Pharmaceuticals
Demuris	2007	Active	Health and Pharmaceuticals
Dynamic Extractions	2001	Active	Other
EKB Technology	2004	Dissolved ⁴	Chemicals
Equinox Pharma	2002	Active	Health and Pharmaceuticals
Ex Scientia	2012	Active	Health and Pharmaceuticals
Glycoform	2002	Dissolved ⁵	Health and Pharmaceuticals
IntelliHep	2002	Active	Health and Pharmaceuticals
Membrane Biotechnologies	2004	Dissolved ⁶	Health and Pharmaceuticals
Metabolomic Diagnostics	2011	Active	Health and Pharmaceuticals
Norfolk Plant Sciences	2007	Active	Agriculture (crops)
Procarta Biosystems	2007	Active	Health and Pharmaceuticals
Progenteq	2009	Active	Health and Pharmaceuticals
ReedTech	2007	Dissolved ⁷	Health and Pharmaceuticals
Signal Pharma	2010	Active	Health and Pharmaceuticals
ClarinnisBio (formerly Stem Cell Development)	2008	Dormant	Health and Pharmaceuticals
StrataStem	2012	Dormant	Health and Pharmaceuticals
ThioLogics	2011	Active	Health and Pharmaceuticals
Tissue Regenix	2006	Active	Health and Pharmaceuticals
Well Cow	2003	Active	Agriculture (animals)
Xelect	2012	Active	Agriculture (animals)

¹ a2sp's technology was acquired by Tangent Reprofile in 2008.

² Celltran was acquired by York Pharma in 2008.

³ Chameleon Biosciences was acquired by Biotectix LLC in 2011

⁴ EKB Technology was wound up in 2012.

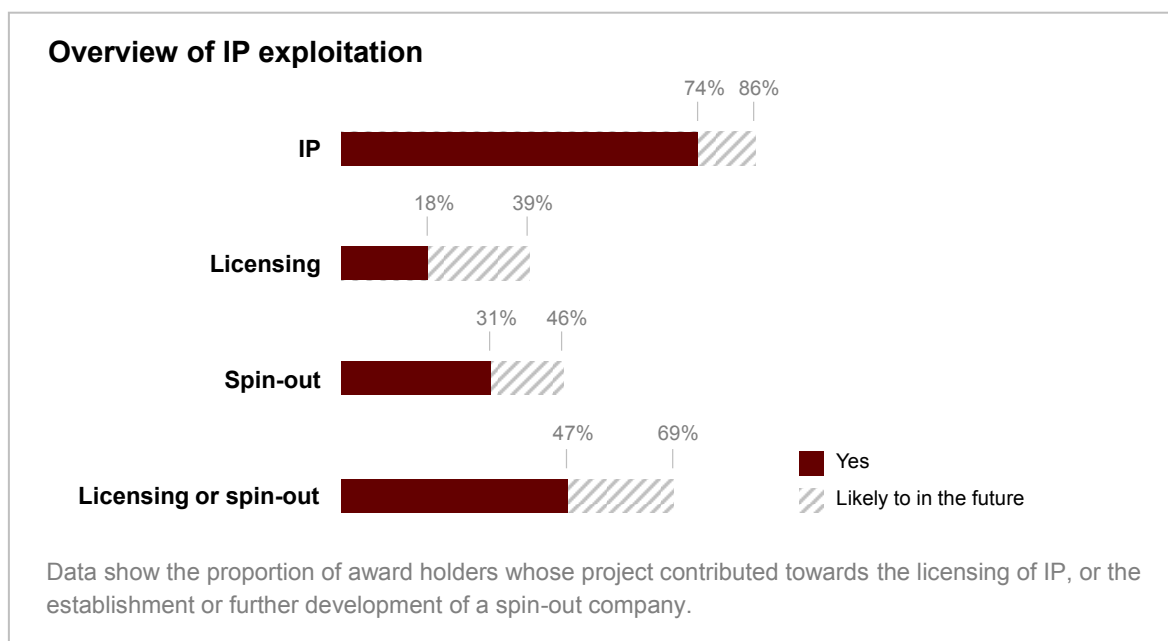
⁵ Glycoform was wound up in 2011.

⁶ Membrane Biotechnologies was liquidated in 2009; the bioreactor technology subsequently formed the basis of another spin-out, Zyoxel.

⁷ ReedTech's technology was subsequently licensed to another company that set up a subsidiary to commercialise it.

3.5 Overview of IP exploitation

49. Licensing and spin-outs were the two main mechanisms used to exploit the IP from FoF projects. Overall, about half of award holders reported that they either licensed the IP to others, or that the project had contributed to the establishment or further development of a spin-out company. These data are a positive indicator that FoF project research ideas are making progress towards being translated.



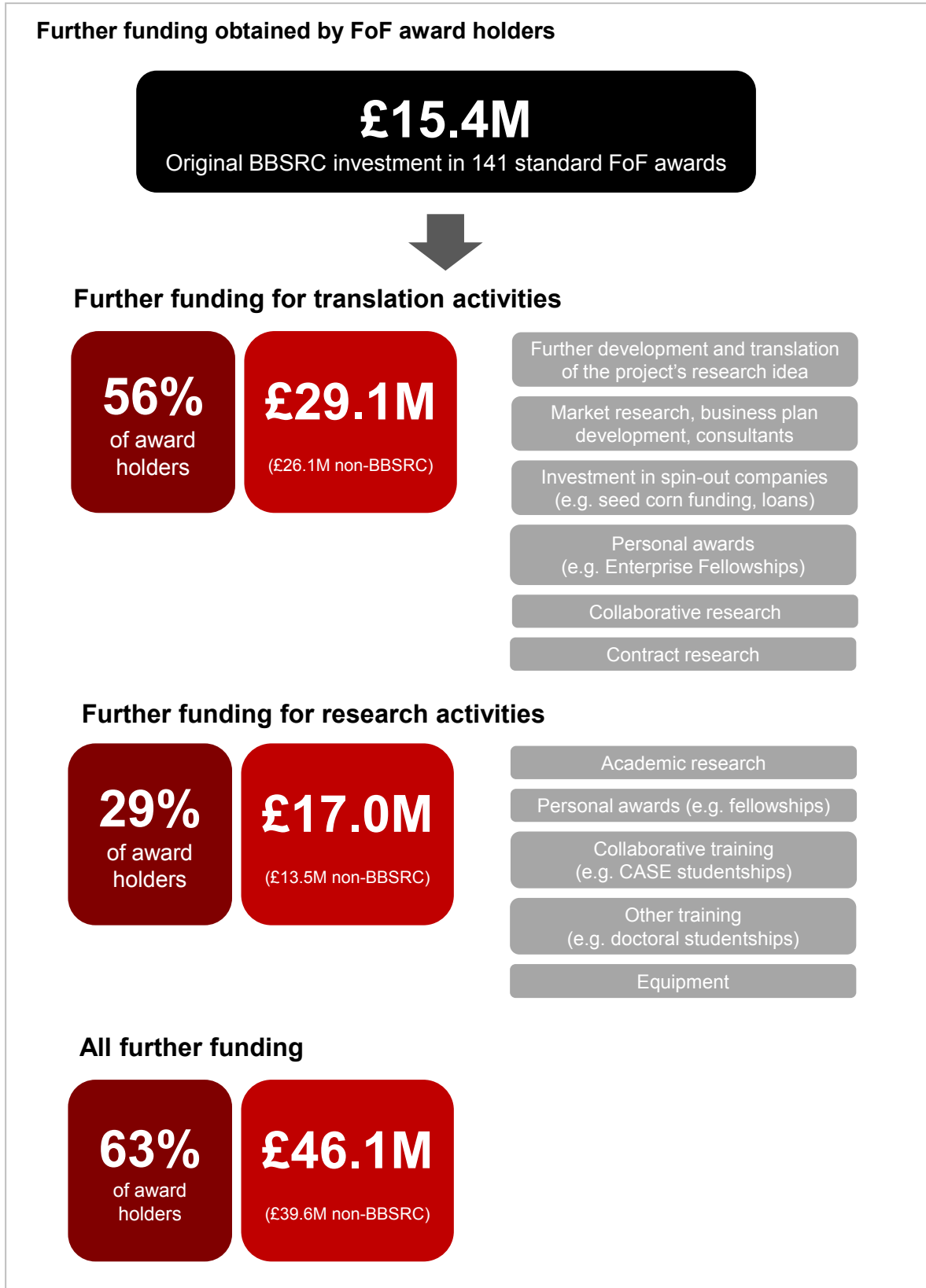
3.6 Further funding

50. Award holders obtained extensive further funding to continue the translation of their research idea or develop the research associated with the FoF project. In total, £46.1M¹⁷ further funding was reported. This is approximately three times the initial BBSRC investment and a very impressive achievement. The majority of funding was from non-BBSRC sources and, in total, over 90 non-BBSRC funding sources were reported. These included charities and foundations, the European Union, foreign governments, industry, internal institutional funds, investment funds, learned societies, regional development funds, other Research Councils, and UK government departments and agencies. The nature of many of these suggested that award holders were continuing to translate their research idea. A key objective of the FoF is to enable researchers to progress their project to the point at which other non-BBSRC funding becomes available. Award holders’ success in obtaining further funding underlines the effectiveness of the FoF mechanism in this context.

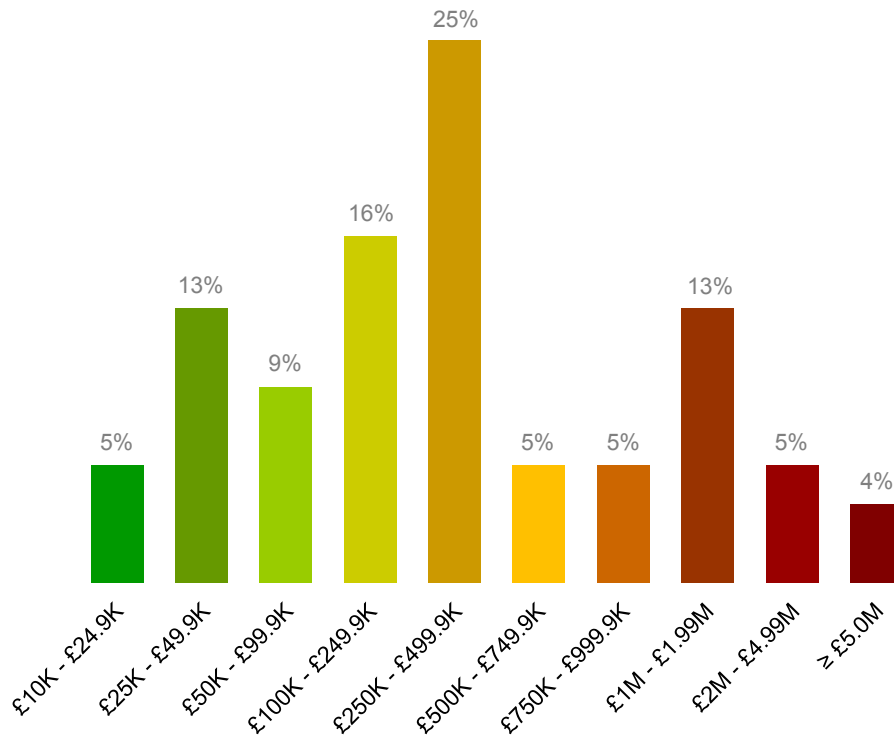
51. Many award holders obtained investment from private sector sources to develop their project. Private sector investment is a strong indicator of the value of being created by FoF projects. Moreover, these funders expect to realise a return on their investment, indicating that the projects are expected to generate further value in the future. The

¹⁷ The data are likely to underestimate the total amount of further funding received. For example, some award holders did not provide specific details on the value of their further funding. In addition, the reporting of any subsequent investment in a spin-out company was variable. The data exclude internal funding used to support the protection of IP and licensing income.

further funding was not evenly distributed among all award holders and there were examples of projects that obtain very substantial levels of investment. It is encouraging that the FoF is producing clear winners. In some respects, the FoF is similar to a very early-stage venture capital fund and the economic return to the UK from the scheme could be justified by a small number of very successful projects.



Distribution of FoF projects' further funding by value (where achieved)



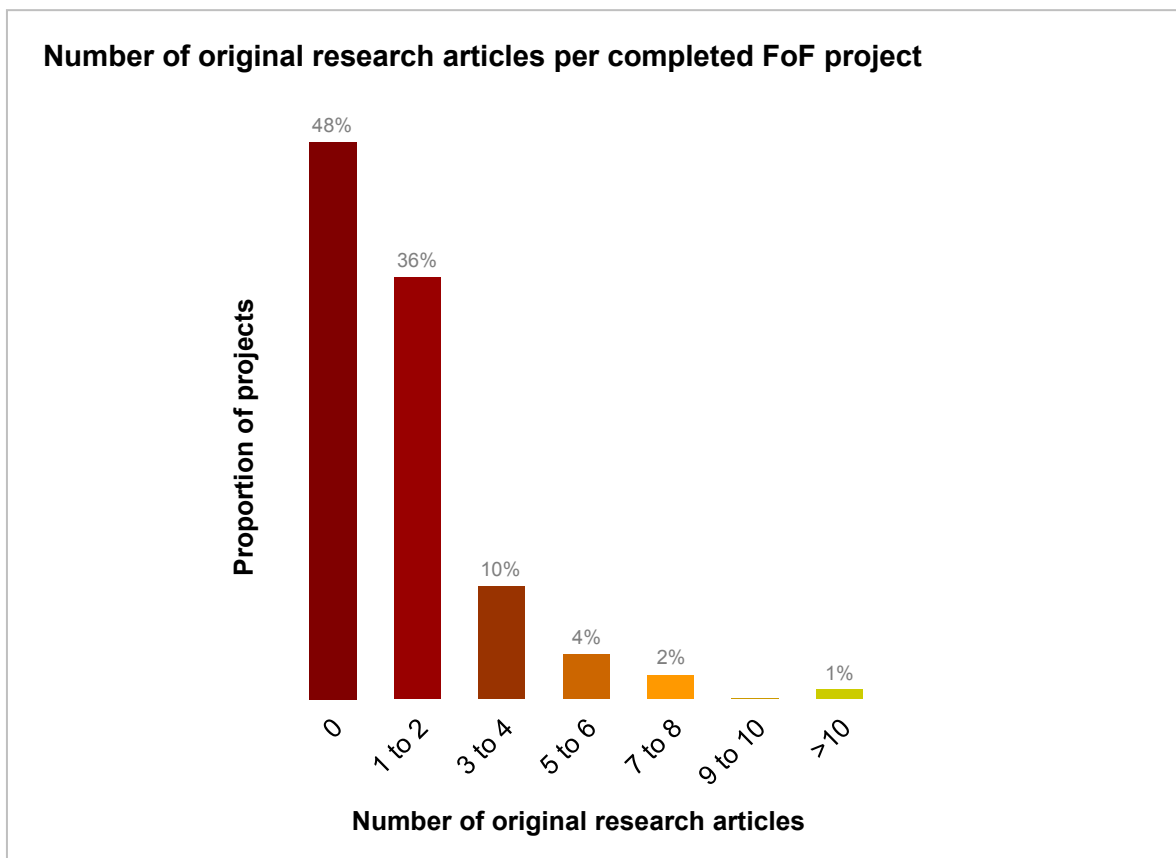
Data are only for those projects that attracted further funding. Data show the proportion of projects in each category. Data exclude projects where no further funding was reported (37% of projects) or where the value of further funding was not known (10% of projects).

3.7 Collaborations and partnerships

52. A notable proportion of FoF award holders had used the award to develop new or improved partnerships with others. This was a positive outcome and, overall, 73% of award holders reported that their project led to new or improved partnerships with others (academic and non-academic partnerships).
53. 58% of award holders reported that their project led to new or improved partnership links with industry of other non-academic organisations, involving over 100 non-academic organisations. There was representation from a variety of sectors (e.g. agriculture, animal health, food and drink, healthcare and pharmaceuticals) and company sizes (multinationals, SMEs, spin-outs). For a small proportion of award holders (5%), collaboration with a non-academic partner was the primary route for translating their research into practical application. 46% of award holders reported that their project led to new or improved partnership links with academics in the UK or overseas. 32% reported a new or improved partnership links with international academics. The majority of international partnership links were with researchers in other European Union countries or the USA.

3.8 Publications

- 54. Publications are not expected to be a major output of FoF projects, although they can arise from the research activities supported by the awards. In total, 138 original research articles were reported and the median number of original research articles arising from each project was 1. The papers were published in appropriate journals given the nature of research supported through the FoF scheme.
- 55. Within the FoF scheme, there can be tensions between the need for award holders to protect their project’s IP and the desire to publish their research. Academics are aware of these constraints and several noted that they had delayed publications to protect IP. In this context, it is important that researchers consider when best to publish and / or patent, so that an appropriate balance is maintained.



3.9 Other outcomes and achievements

- 56. FoF awards also contributed to a variety of other outcomes and achievements. These included training and skills development, staff career development, invitations to present the work at meetings and conferences, awards and prizes, science communication and public engagement activities, and income for the host institution.

3.10 Longer-term economic and societal impacts

57. It was difficult to comment on the longer-term economic and societal impacts arising from the FoF scheme as many projects were still actively seeking to translate their research idea into practical application. There were clear examples within the portfolio of projects that had strong potential to deliver economic and societal benefits, and a few projects had already done so. Areas where FoF projects had made, or had the potential to make, contributions to the wider public good include animal health, animal welfare, biotechnology, the environment and mitigating climate change, food security and sustainable agriculture, industrial biotechnology, and human health. There were also examples of positive outcomes associated with commercial partners' use of the innovations developed through FoF projects (e.g. job creation, increased sales, international exports). Capturing these longer-term benefits is a challenge for the FoF scheme (see section 2.8), particularly where the direct beneficiary is an industry partner and the details are commercially sensitive.

3.11 Overview of project outcomes and achievements

58. Overall, the outcomes and achievements arising from the FoF portfolio were very positive. They demonstrated the high quality of the projects and provided a strong indication that award holders had made good progress with translating their research ideas into practical application. There were several examples of excellent projects that had done exceptionally well. This is very encouraging as a small number of highly successful projects may alone be sufficient to justify BBSRC's investment in the scheme.

4. Balance and coverage of the portfolio

Summary

- BBSRC's level of investment in the FoF is appropriate
- the FoF supported a variety of projects from across the BBSRC remit
- there was reasonable alignment between the FoF and BBSRC research grant portfolios, but FoF projects related to health were overrepresented
- there was scope for BBSRC to develop a greater 'portfolio view' of the FoF, managing the links between related projects more closely
- some projects in the health sector appeared to support activities which were outside of BBSRC's remit
- the 12 month maximum duration limit for standard FoF awards was often not sufficient for the objectives to be completed
- the FoF had attracted and supported applications from researchers with a variety of previous experience in translating research ideas into practical application

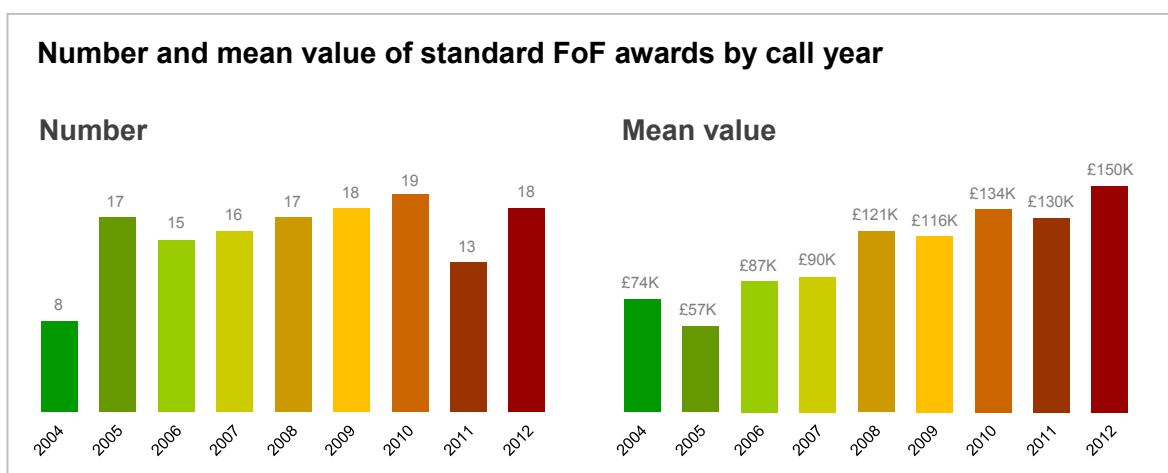
4.1 Overview of BBSRC's investment in the FoF

59. Since the FoF scheme's inception in 2004, BBSRC has supported 141 standard FoF awards and five Super FoF awards^{18,19,20}. BBSRC's total investment in these awards was £17.9M (£15.4M for standard FoF; £2.5M for Super FoF).
60. The number of standard FoF awards supported each year remained relatively constant over the evaluation period, although BBSRC's total investment in the scheme increased steadily. The mean value of a standard FoF award doubled from £74K in 2004 to £150K in 2012. There was also a welcome increase in investment in the FoF as a proportion of all BBSRC research grant spend; this rose from 0.3% in 2004 to 2.1% in 2012. It is appropriate for BBSRC to invest about 2% of its research budget in the FoF. This ensures that there is sufficient support for translation activities and that opportunities to deliver wider benefit from BBSRC-funded science are not lost.

¹⁸ Data are for the 2004 to 2012 call only and include awards with start dates from 1 April 2004 to 8 August 2013. Awards from the 2013 call are not included. Pathfinder awards are not included (see Chapter 5).

¹⁹ Data refer to individual awards rather than projects. In total, the FoF has supported 131 projects. Fourteen projects were supported by more than one award.

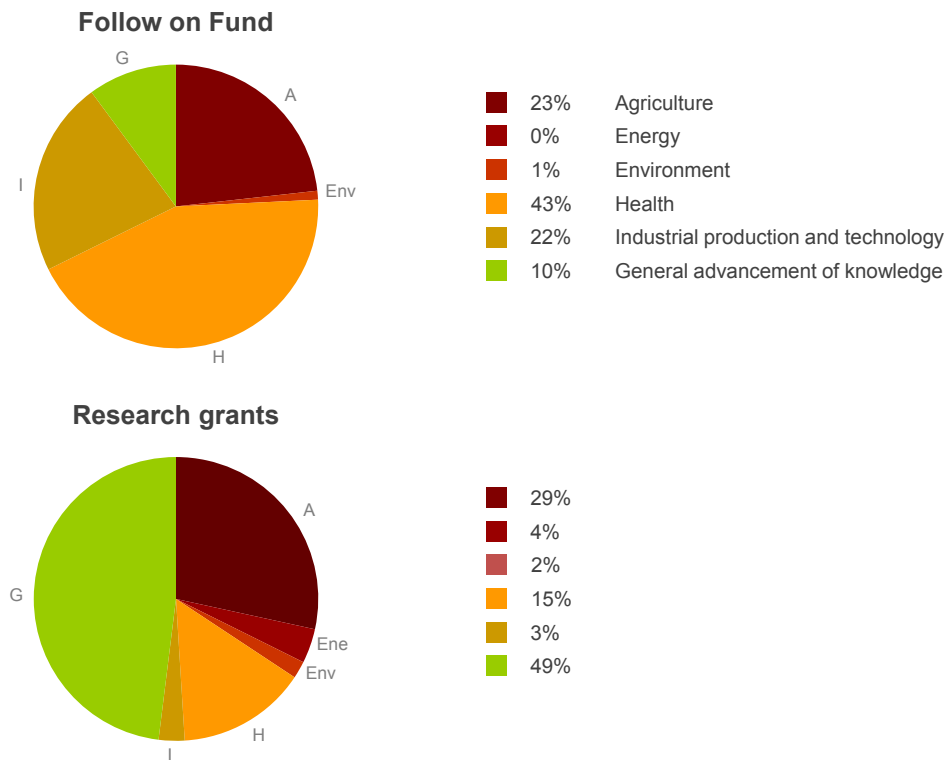
²⁰ As at 1 August 2013, 116 awards were complete and 30 were current.



4.2 Funding by research area

61. The FoF supported a welcome variety of projects from across the BBSRC remit. In general, there was a reasonable alignment in the coverage of FoF and the BBSRC research grant portfolios, and with the major research priorities identified in BBSRC's Strategic Plan. However, there was a clear asymmetry in the area of health which was overrepresented within the FoF compared with BBSRC research grants.
62. The emphasis on health-related projects was to be anticipated as the UK health sector is large and has a strong value chain. Moreover, historically, the FoF focused on the commercialisation of research ideas and realising an economic return on the investment, which is a more established and better understood route for translation for biomedical research. There is now greater recognition that it is not necessary to generate a financial return to deliver benefits to society from excellent research, and FoF projects where the route to application is a social enterprise or not-for-profit are more likely to be supported (with the understanding that such projects still need a robust 'business' model to ensure long-term sustainability). This shift in emphasis is a welcome development and may provide an opportunity to broaden the FoF portfolio in the future, increasing the representation from other sectors where there is more limited potential to produce a commercial return. There were some potential remit questions with the direction of some of the health-related projects (see section 4.4).
63. There were examples within the FoF portfolio of several projects that were exploring very similar topics or research ideas (e.g. computational drug design). BBSRC had not managed the connections between such projects across the FoF as a whole, however. There are advantages in BBSRC developing a greater 'portfolio view' for the FoF, for example, managing the links between related projects more closely and encouraging researchers to work in partnership where appropriate. It is recognised that this would be challenging where researchers (and the IP) are based at different institutions. BBSRC could consider introducing specific calls in particular areas to assist with developing links within the FoF portfolio, although it would also be important to retain the responsive nature of the FoF scheme in general.

Classification of FoF awards by Office of National Statistics NABS codes

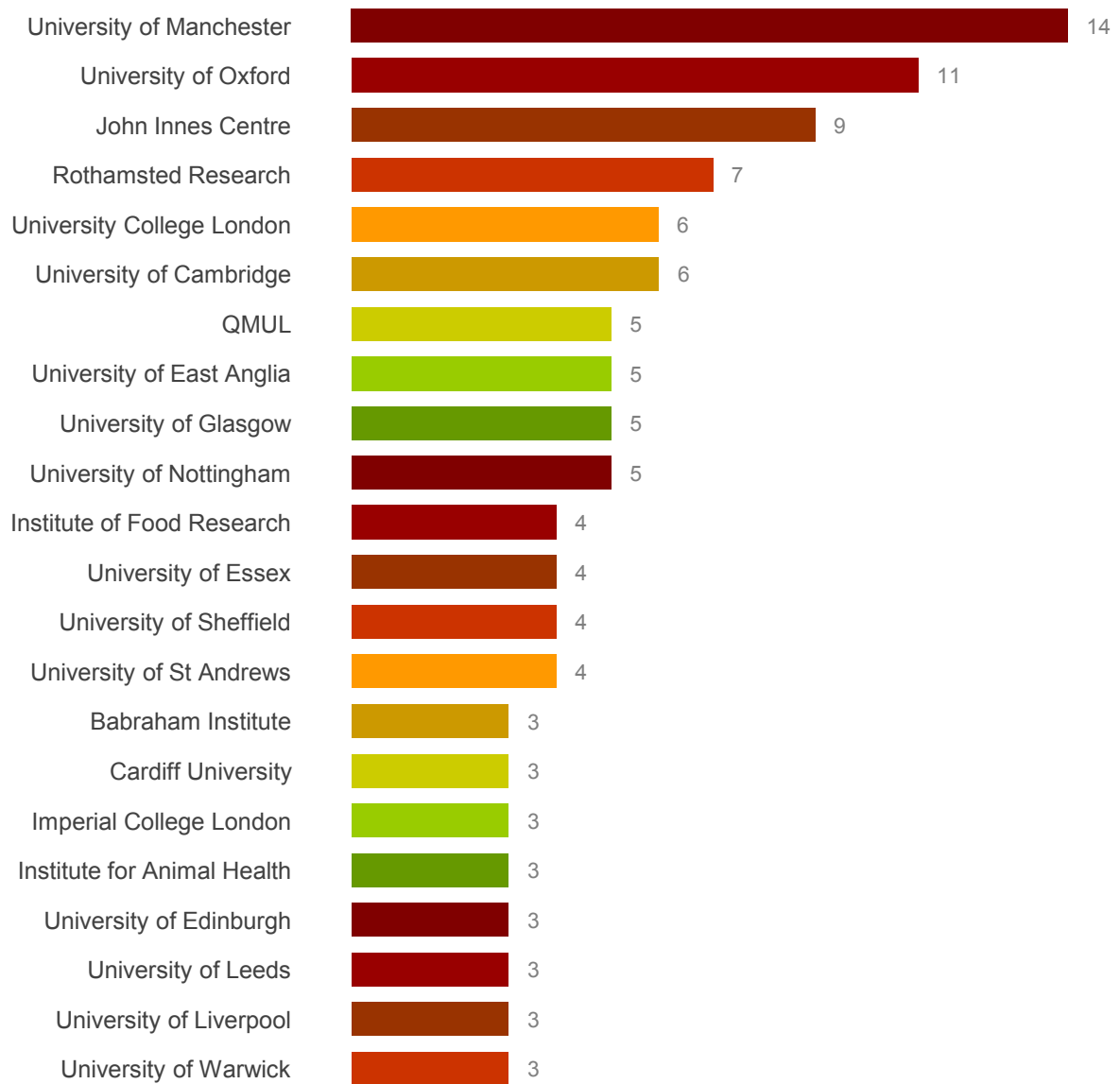


Data for the FoF are based on the number of standard FoF and Super FoF awards. Data for research grants are based on research grant and Institute Strategic Programme Grant spend in 2012/13. It should be noted that some of the differences between the FoF and research grant portfolios are a consequence of the underpinning nature of BBSRC research grant funding. For example, much of the basic research which may underpin future advances in health or agriculture will be classified as 'general advancement of knowledge'. NABS: Nomenclature for the Analysis and Comparison of Scientific Programmes and Budgets.

4.3 Funding by institution

64. In total, 44 institutions had received FoF support. Twenty six (87%) of the current top 30 BBSRC-funded HEIs had received at least one FoF award. Five (83%) of the six BBSRC strategically funded institutes had received at least one FoF award. In general, there was a good alignment between the level of BBSRC funding received by an institution and the number of FoF awards obtained. However, there were some outliers that received notably more or fewer awards than might be expected.
65. The Panel noted the missions of the BBSRC strategically funded institutes and their importance in conducting strategic research. The Panel strongly endorsed the eligibility of these institutes to apply for FoF support.

Standard FoF awards by institution



The following institutions received one or two awards: Aberystwyth University (2), Aston University (1), Brunel University (1), Durham University (1), Institute for Grassland and Environmental Research (1), London School of Hygiene & Tropical Medicine (1), Newcastle University (2), Queen's University Belfast (1), Royal Veterinary College (1), Silsoe Research Institute (1), University of Bath (1), University of Birmingham (2), University of Dundee (1), University of Exeter (1), University of Leicester (2), University of Portsmouth (2), University of Reading (1), University of Salford (1), University of Southampton (2), University of York (1). It should be noted that institutions may use other internal and external mechanisms to support translation or proof-of-concept activities.

4.4 Supporting activities in the BBSRC remit

66. BBSRC is only able to support activities that are within its remit. However, the interpretation of this constraint is more complex for translational activities compared with research grants and there is a need for some flexibility. It is expected and appropriate for BBSRC-funded research ideas to move outside BBSRC's remit as they are translated into practical application. For example, in the area of human health, BBSRC research that underpins the understanding of normal function is likely to find application in addressing disease.
67. The majority of FoF projects supported over the evaluation period were within BBSRC's remit. However, for projects in the health sector, the exact alignment with BBSRC's remit was often not clear and there was concern that some projects were supporting activities which were within the remit of the Medical Research Council (MRC)²¹. BBSRC should give further consideration for remit issues within the context of the FoF. There is a need for more explicit guidance on the types of activities BBSRC will support and for how far and how long BBSRC's support will extend. In the health sector, it is appropriate to support FoF projects that are developing broadly applicable technologies as well as more basic drug development. Drug target validation and drug hit identification are too far outside BBSRC's remit and should not be supported.
68. Several examples of existing good practice to reduce remit issues were identified. BBSRC Office offers advice to applicants on request and applies a remit check before applications are reviewed by the FoF Committee. The Committee also has an opportunity to comment on whether the applications are within remit. There is scope for further improvement, particularly in how BBSRC works with other Research Councils and funders (see Chapter 6).

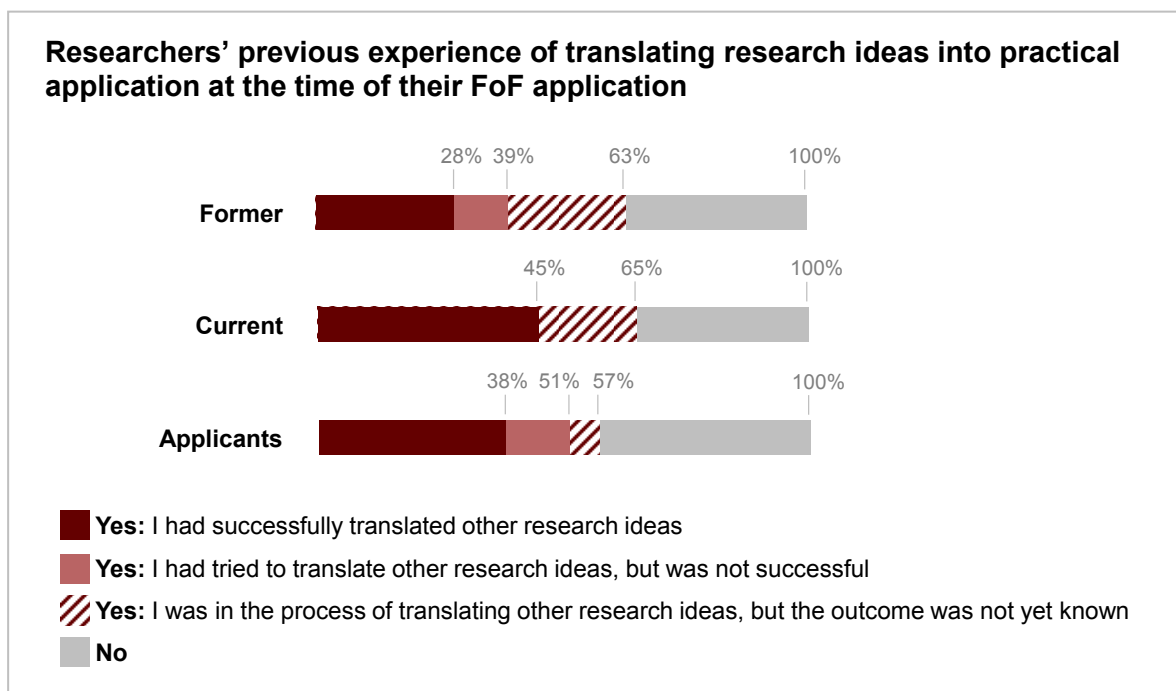
4.5 Duration of the FoF awards

69. Standard FoF and Super FoF awards provide up to 12 and 24 months support respectively. Researchers may request a no-cost extension to their award which is subject to approval to BBSRC. The mean duration of completed standard FoF awards over the evaluation period was 14.1 months and 37% of these awards were of more than 12 months duration. It appeared that the current 12 month limit for standard FoF awards was often not sufficient to enable the project's objectives to be completed; BBSRC should consider increasing the maximum duration of these awards (see also Chapter 6).

²¹ The interface between the BBSRC and MRC remits is complex. In the context of human disease, BBSRC supports research relevant to understanding normal human function, whereas the MRC supports work focused on specific human diseases, disease processes, or abnormal conditions.

4.6 Researchers' previous experience with the translation of research ideas

70. The FoF had attracted and supported applications from researchers with a variety of previous experience in translating research ideas into practical application. The majority of award holders had some previous experience at the time of their FoF application. However, about one third were new to this type of activity, which was very encouraging. Support for these new researchers can help deliver culture change within institutions, for example, by providing greater visibility to the impact agenda. Moreover, it provides reassurance that the scheme is supporting the best research ideas, regardless of the applicant's previous experience with translation.



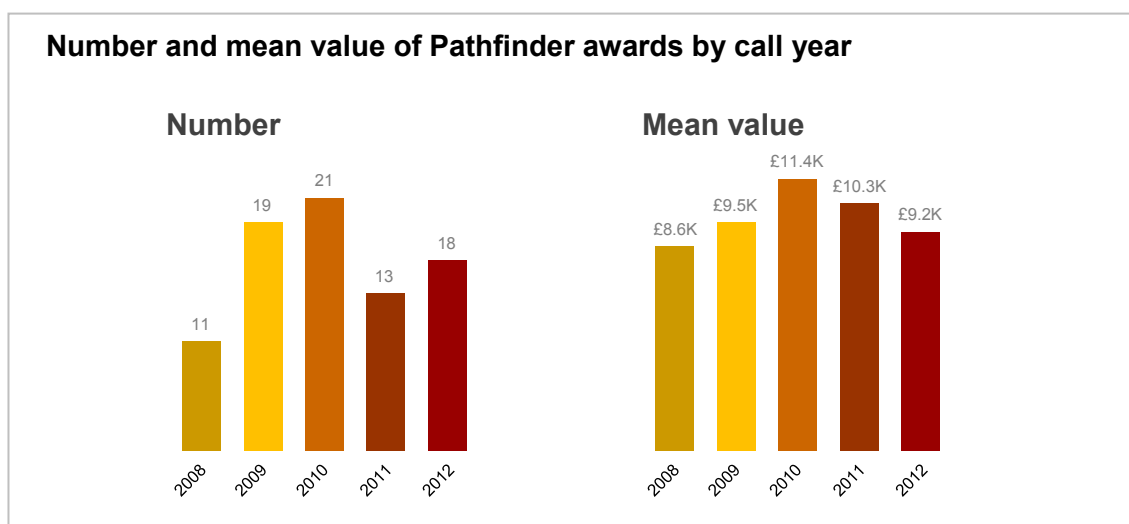
5. The Pathfinder scheme

Summary

- the Pathfinder scheme is a useful addition to BBSRC's support for translation activities
- Pathfinder funding was used effectively and flexibly to support translation activities
- Pathfinder awards were primarily used to support market assessments
- about half of all Pathfinder awards were associated with a subsequent FoF application
- there was no evidence that Pathfinder award holders had an increased success rate for subsequent FoF applications
- the scheme's application and assessment processes are appropriate given the level of investment in each award

5.1 Overview of BBSRC's investment in Pathfinder awards

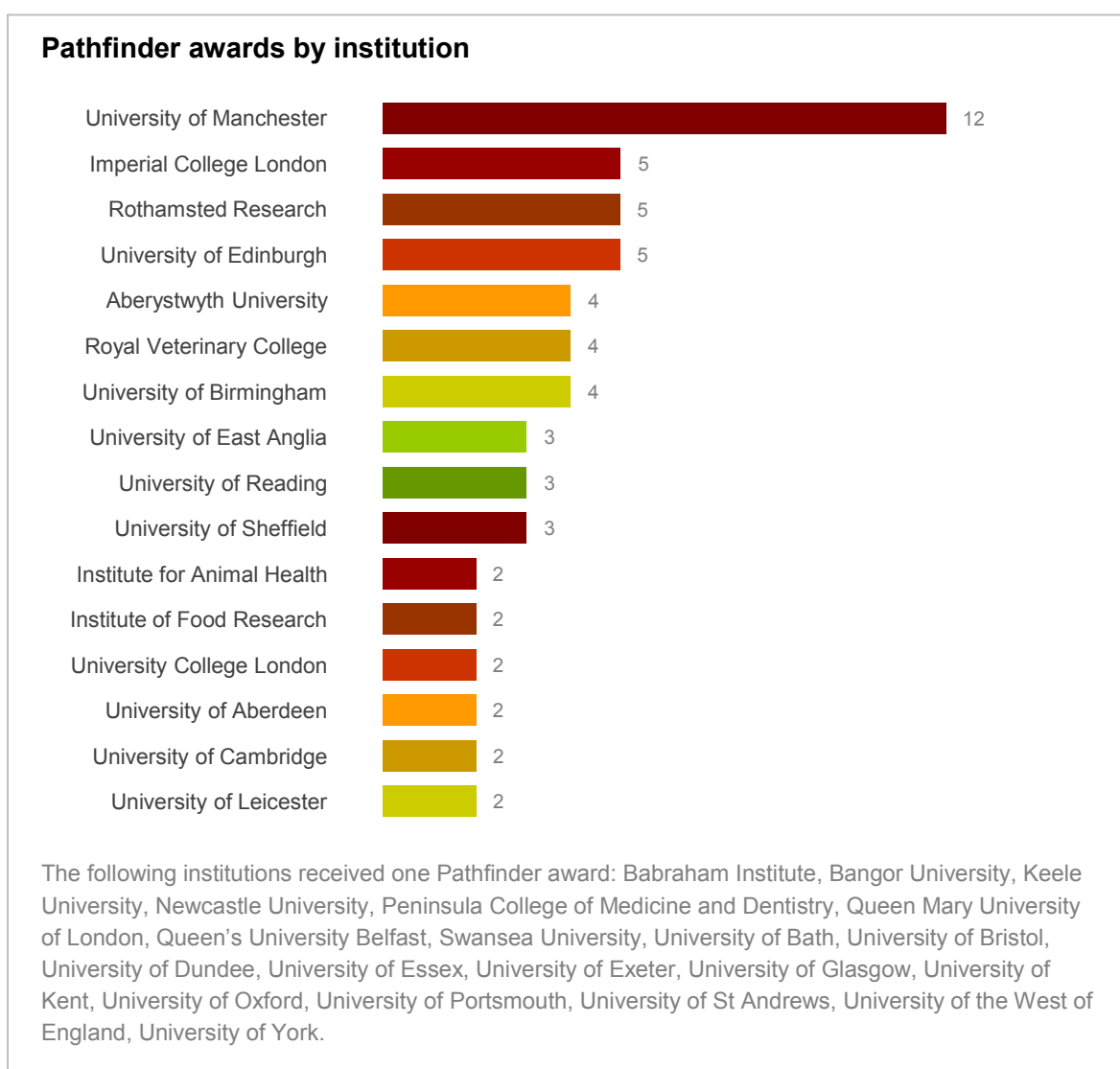
71. The Pathfinder scheme was introduced in 2008 and is very closely associated with the FoF. The scheme aims to help researchers undertake the preliminary work required to put them in a position to apply for a FoF award. It enables researchers to develop a better understanding of their proposition and the potential route to application, which is often unclear at the earliest stages of a project. Pathfinder awards typically focus on evaluating the market potential of the research idea and the comparative strength of the intellectual assets. If the technical feasibility of the project depends on it, support can also be provided for the achievement of technical milestone one.
72. Since the scheme's inception, 80 Pathfinder awards have been made with a total BBSRC investment of £789K²². Over the evaluation period, the mean value of a Pathfinder award was £10K.



²² Data are for the 2008 to 2012 call years only.

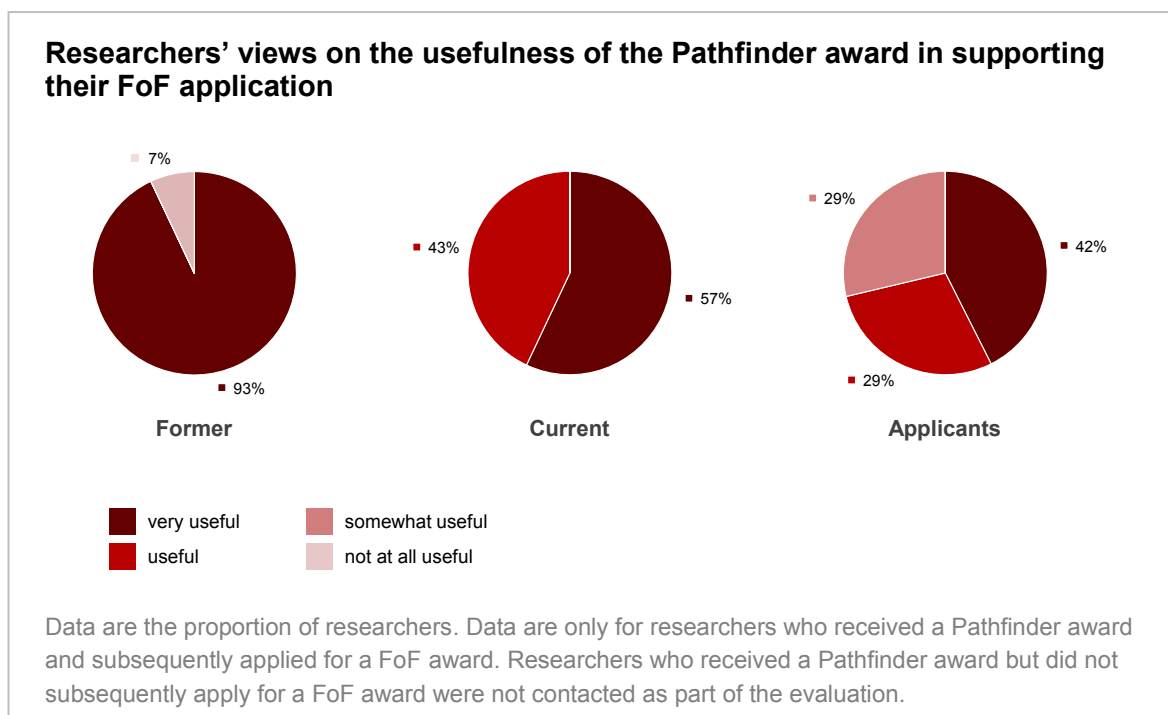
5.2 Funding by institution

73. In total, 33 institutions had received Pathfinder support. Twenty one (70%) of the current top 30 BBSRC-funded HEIs had received at least one Pathfinder award. Four (67%) of the six BBSRC strategically funded institutes had received at least one Pathfinder award. For individual institutions, there were often notable differences between the proportions of Pathfinder awards and FoF awards received. There were also differences in the proportions of Pathfinder awards and BBSRC research grant funding received. It should be noted that some institutions have access to other sources of funding to support very early-stage translation activities and this may influence their decision on whether to apply for Pathfinder funding.



5.3 Outputs, outcomes and achievements

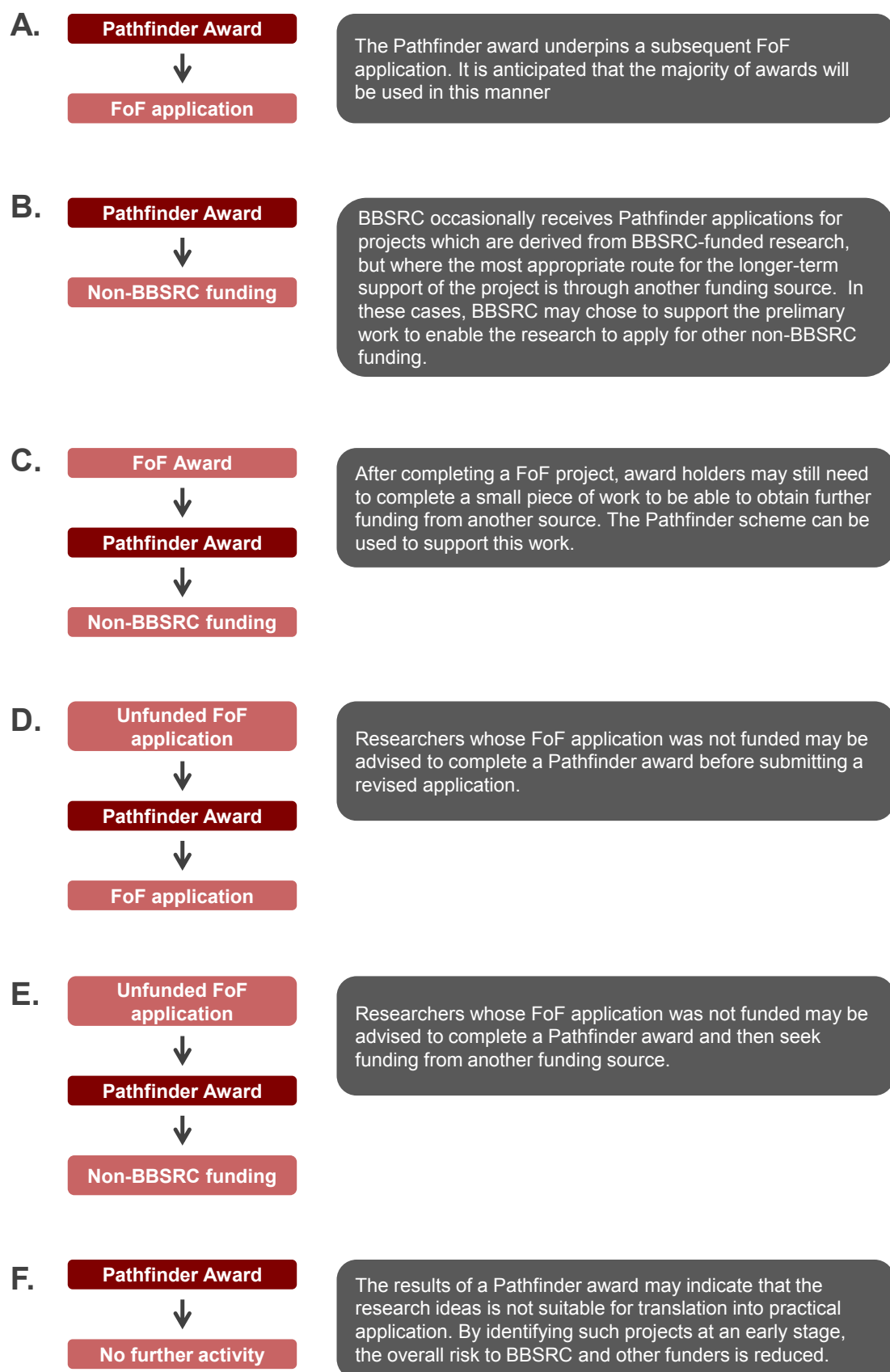
74. Pathfinder awards were primarily used to conduct market assessments. This is an appropriate use of the funding, as the focus of the Pathfinder scheme should be to support the translation component of a project rather than additional research. There was some variation in the quality of market reports that were commissioned; award holders stated that some were very good whereas others were of limited value. There may be scope for BBSRC to provide further guidance to researchers about commissioning effective market assessments, although it is recognised that the Council cannot recommend individual providers. Some technical development was also funded through the Pathfinder scheme; it is positive that early stage feasibility assessments are supported.
75. There were limited data available to assess the outcomes and achievements of the Pathfinder awards²³. About half of all Pathfinder awards were associated with a subsequent FoF application and a majority of researchers stated that the Pathfinder award was very useful in supporting their FoF application. There was no evidence that Pathfinder award holders had an increased success rate for subsequent FoF applications compared with other researchers. Nevertheless, it was likely that the market assessments and external advice commissioned through the Pathfinder scheme benefited the delivery of the associated FoF projects.



76. A major objective of the Pathfinder scheme is to put researchers in a position to apply for a FoF award. It was also pleasing that BBSRC used Pathfinder funding in a flexible manner, supporting a variety of other activities to enable the translation of research ideas into practical application. The awards were used at different stages of the translation process and enabled researchers to follow various routes to progress their project after the Pathfinder award ended.

²³ There is no formal end-of-award reporting on the outputs and outcomes of Pathfinder awards. Award holders are asked to provide BBSRC with a copy of any market assessment they commissioned.

Examples of the potential uses of Pathfinder awards



5.4 Application and assessment processes

77. Pathfinder applications are assessed within BBSRC Office using external expertise from the FoF assessment committee. Normally, a funding decision is made within 30 working days of submission. The light-touch assessment process and the quick turnaround are welcome features of the scheme, and reflect the relatively small level of investment in each award.
78. The success rate for Pathfinder applications over the evaluation period was very high (89%) and it is therefore important to consider whether the effort involved in assessing the applications is an effective use of resources. On balance, the process is appropriate and it is important that applications are subject to peer review. It provides assurance that the funding will be used appropriately and offers an opportunity to provide valuable feedback and advice to applicants. Researchers are encouraged to contact BBSRC Office before submitting a Pathfinder application and it is likely that this contributes to the high success rate for the scheme.
79. It is useful that researchers are able to apply for Pathfinder funding at any time. However, it is essential that Pathfinder awards are timed appropriately to maximise the value of the funding. In particular, there must be sufficient time between the Pathfinder award and any subsequent FoF application (e.g. six months); this enables the Pathfinder work to be conducted to a high standard and the FoF application to take account of the Pathfinder award's findings. BBSRC should provide additional guidance on the best practice for the use of Pathfinder awards and discourage applicants rushing the process to meet the next FoF application deadline. In this context, the Pathfinder application form should require applicants to indicate whether they intend to apply for a Pathfinder award.
80. Overall, Pathfinder awards are a useful addition to the FoF and BBSRC's support for translation activities. The awards were used effectively and helped researchers understand the potential route to application for their research idea.

6. Application and administration processes

Summary

- the FoF has attracted a good number of high-quality applications
- the FoF application success rate is appropriate
- there were notable differences between FoF application success rates for individual institutions
- the application and assessment processes for the FoF are effective
- BBSRC should explore alternative models for the FoF Committee to increase the amount of relevant expertise used to review each application
- the FoF is an effective mechanism for supporting the translation of BBSRC-funded research into practical application and should be retained
- there is a need for BBSRC to work more closely with other funders to support the translation of research outcomes
- it is unlikely that the FoF investment would have achieved a similar level of success through a devolved funding model

6.1 Context

81. FoF applications are assessed by the FoF Committee which includes experts from academia, industry, knowledge exchange professionals and investment fund managers. The assessment criteria are:

- scientific excellence
- potential economic and social impact
- quality of the development plan
- added value

82. The assessment processes differ slightly for standard FoF and Super FoF awards:

- **Standard FoF applications**
 - full applications only; there is no outline application stage
 - assessed directly by the FoF Committee; there is no other peer review²⁴
- **Super FoF applications**
 - two stage application process (outline and full applications)
 - full applications are by invitation only (by outline or previous FoF award)
 - full applications are peer reviewed by two subject area experts; applicants are able to respond to reviewers' comments
 - full applications are assessed by the FoF Committee, taking into account the reviewers' comments and the applicant's response.

83. The data in this chapter focus on standard FoF applications. There were limited data available for Super FoF applications as these awards were only introduced in 2012. Pathfinder applications were covered in Chapter 5.

²⁴ All FoF applications must draw substantially on previous BBSRC research funding. As such, the science in the application has already been subject to peer review.

6.2 FoF application numbers and success rates

84. The FoF had attracted a good number of applications over the evaluation period. In total, 421 applications for standard FoF awards were received²⁵. The number of applications received per year had decreased slightly since 2009 and, currently, about 35 standard FoF applications are received each year. The decrease in number of applications may be partly attributable to the introduction of Pathfinder and Super FoF awards.
85. The success rate for standard FoF applications over the evaluation period was 33%. It increased over time, rising from 21% in 2004 to 53% in 2012. The success rate was higher than for BBSRC research grant applications. It is appropriate for BBSRC to have high success rates for translation activities to help maximise the delivery of benefits from its research investments. The FoF supported high quality applications and there was no evidence that the high success rate had led to poor quality projects being funded.
86. It was difficult to comment on the Super FoF application success rate as the number of applications received since the scheme's launch in 2012 was relatively small. The available data indicated that the success rate for full Super FoF applications was higher than for standard FoF applications. The Super FoF outline application stage was helpful in this context.

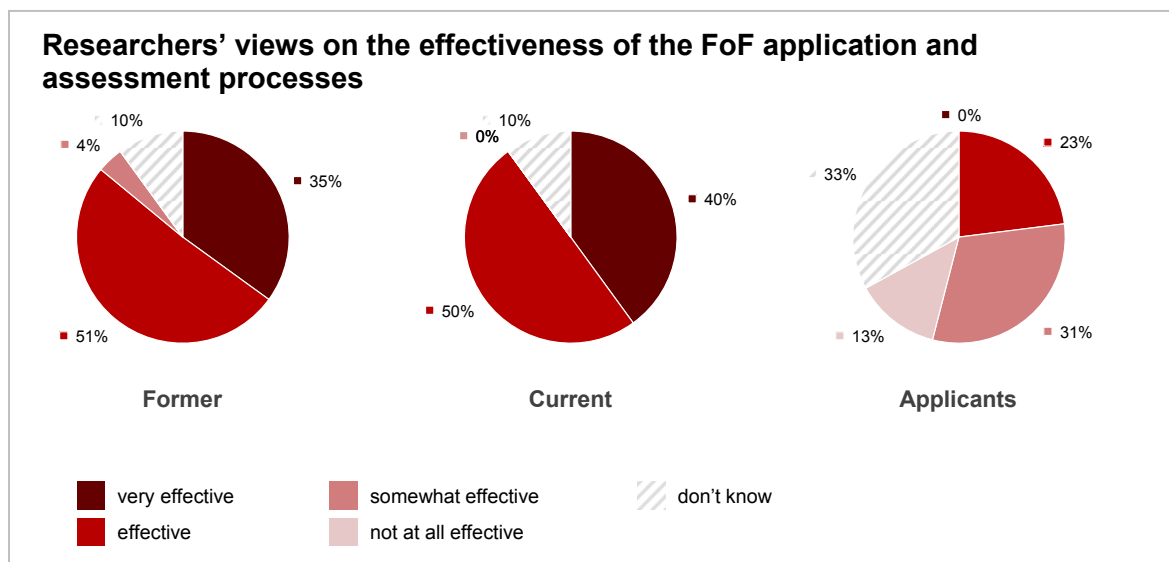
6.3 Applications by institution

87. In total, 64 institutions had applied for a standard FoF award. Twenty nine (97%) of the current top 30 BBSRC-funded HEIs had applied for at least one FoF award. Five (83%) of the six BBSRC strategically funded institutes had applied for at least one FoF award.
88. Although there was good alignment between the level of BBSRC funding received by an institution and the number of standard FoF awards obtained (see Chapter 4), the data for applications were more variable and there were notable differences between the application success rates for individual institutions. For example, among institutions submitting five or more standard FoF applications, the success rate ranged from 13% to 69%. It is important to note that applications may not be funded for a variety of reasons (e.g. quality, remit, alignment with BBSRC priorities, market opportunity).

²⁵ Data are for the 2004 to 2012 call years.

6.4 Application and assessment processes

89. The application and administration processes for the FoF were effective. The majority of award holders were satisfied with these processes although, as might be expected, applicants who were not funded were less satisfied.



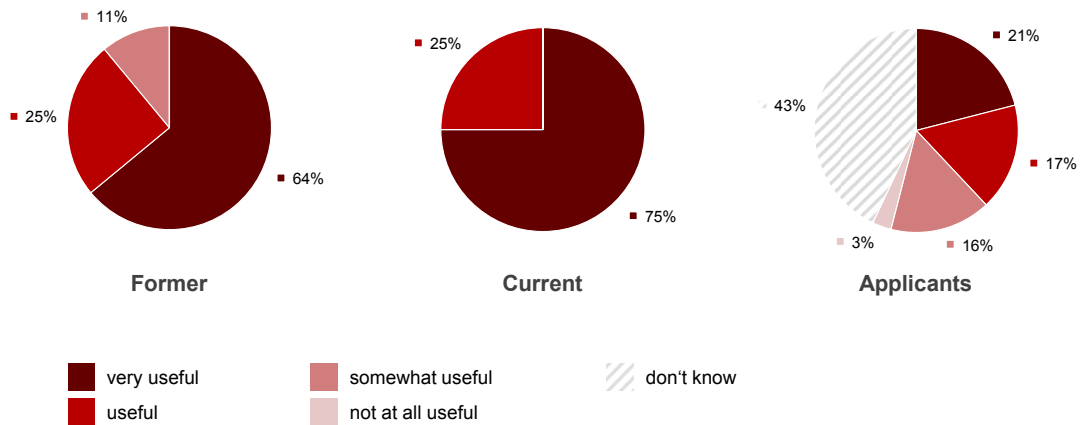
90. There were several examples of good practice associated with the FoF scheme's application and assessment processes. The application process was relatively light-touch and it was encouraging that consideration had been given to minimising delays and ensuring that funding decisions were reached quickly. The FoF Committee had a good breadth of expertise and included an appropriate balance of academic and non-academic experts (e.g. industry, knowledge exchange professionals).
91. The support provided to applicants by BBSRC staff was also very good. A major strength of the FoF is that the BBSRC staff who manage the scheme are accessible to the research community. This contrasts with other Research Council funding programmes, where personal contact between Research Council staff and researchers has diminished because of the transfer of functions to shared services. Personal contact can help identify potential issues at an early stage in the application process and its reintroduction for other Research Council funding would be welcome.
92. There are opportunities to improve the FoF's application and assessment processes further. BBSRC should explore alternative models for the FoF Committee to increase the amount of relevant expertise used to review each application. For example, BBSRC could introduce sub-Panels for specific sectors or adopt a system of core and pool Committee membership. For Super FoF awards, which are of a longer duration and higher value, BBSRC should also consider asking applicants to present their proposal to the FoF Committee in person. This would provide the opportunity to ask questions to the applicants directly and also enable the Committee to offer guidance and feedback.
93. Several applicants commented that the feedback provided on their FoF application was very brief and did not explain why the proposal was not funded. This limits the researcher's ability to improve future applications and BBSRC should aim to improve feedback to applicants. This is particularly relevant for unfunded applications which are

at the interface between different Research Council and where there are potential remit issues.

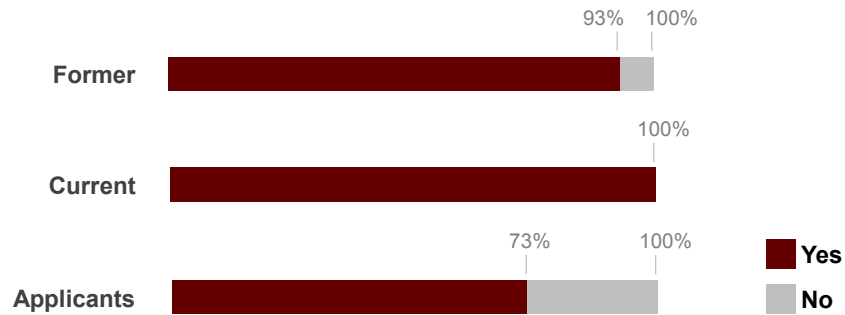
6.5 The effectiveness of the FoF mechanism

94. Overall, the FoF was an effective mechanism for supporting the translation of BBSRC-funded research into practical application. Award holders and applicants viewed the scheme positively and the vast majority indicated that they would consider applying for FoF support again in the future. It was noted that the FoF is one of only a few funding sources available to support the earliest stages of translation.
95. BBSRC adapted the FoF scheme over the evaluation period to ensure that it remained fit for purpose. The introduction of the Pathfinder and Super FoF awards were welcome additions which further improved the support available to researchers. The Council developed a clearer understanding of the types of project that should be supported by the scheme over time. It also broadened the scope of the scheme so that projects that would primarily realise societal benefit were eligible. In addition, BBSRC amended the scheme's application and assessment processes in response to community feedback and behaviour. It is important that BBSRC continues to develop the scheme in the future, for example, in response to changes in the wider UK research and innovation ecosystem.
96. BBSRC supports a variety of funding mechanisms to enable the research community to deliver benefit from the research, training and capability in which it invests. The FoF is a critical component of BBSRC's support for translation activities and without it many opportunities to deliver benefit from BBSRC-funded research would be lost. It complements the other BBSRC support mechanisms, which are also very valuable (e.g. support for collaborative research, people and information exchange, and collaborative training).
97. There were some aspects of the FoF mechanism that could be improved. For example, the distinction between standard FoF and Super FoF awards was not always clear to the research community. It appeared that some applicants applied for Super FoF funding because of the increased duration of the Super FoF awards compared with the standard FoF (24 months vs. 12 months), rather than for the additional financial support. BBSRC should consider the advantages and disadvantages of supporting two variants of the FoF scheme; the distinctions may become less relevant if BBSRC increases the maximum duration of standard FoF awards (see Chapter 4).
98. There were opportunities to increase the level of engagement between BBSRC and TTOs. The Council should consider whether it could develop additional mechanisms to communicate with TTOs and share BBSRC's expectations for the FoF scheme (e.g. workshops). In some instances it may be possible to work with other organisations to develop a dialogue between TTOs and Research Councils (e.g. PraxisUnico), but this may dilute important BBSRC-specific messages (e.g. remit issues). It is recognise that the delivery of such activities would require additional BBSRC staff resources.
99. There was also a need for BBSRC to work more closely with other Research Councils and funders. This is covered in section 6.8.

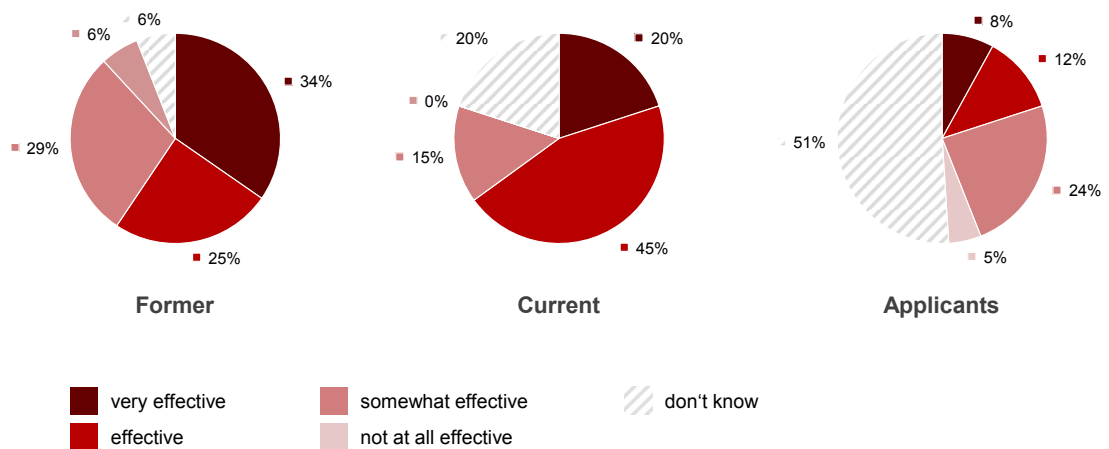
Researchers' views on the usefulness of the FoF for enabling researchers to translate their research into practical application



Proportion of researchers who would consider applying for FoF support again in the future



Researchers' views on the effectiveness of the FoF in bridging the gap between BBSRC-funded research and the point at which other (non-BBSRC) funding becomes available



6.6 Bridging the funding gap

100. It was clear that FoF support enabled projects to make substantial progress with translating ideas from BBSRC-funded research into practical application. It was not possible to complete an idea's translation with a FoF award, but this is not a criticism of the scheme. Ultimately, for FoF projects to be successful and translate their research ideas, it is likely that they will need to access non-BBSRC sources of funding. The FoF aims to bridge the gap between BBSRC-funded research and the point at which other funding become available. However, there is a risk that that FoF investment may simply progress projects further towards translation without addressing this funding gap.
101. Many projects successfully secured further funding from non-BBSRC sources to continue the project after the FoF award ended. In addition, the majority of researchers indicated that the FoF was effective in progressing projects to the point at which other support was available. The recent introduction of the Super FoF was very useful in this context; these awards provide longer and larger support and should enable projects to make further progress before there is a need to seek non-BBSRC support.
102. Researchers indicated that securing further funding after the FoF award ends was difficult. This is not an issue with the scheme as translating research into practical application is challenging and difficulties securing further funding are to be expected. A variety of non-BBSRC support is available to researchers to progress their project after the FoF award ends and BBSRC should develop case studies which highlight the different approaches which have been used. However, there must be clear boundaries at which BBSRC's responsibility for supporting projects ends. These boundaries are likely to vary by sector with, for example, BBSRC support ending earlier for biomedical projects compared with agricultural projects.
103. Overall, the FoF is an effective mechanism for bridging the funding gap and enabling award holders to secure non-BBSRC investment in their project. The scheme has helped to address a market failure in the UK innovation landscape whereby early-stage projects are unable to attract private sector investment. There was also evidence that FoF support made the projects more credible to the next investor. In this context, the provision of private sector funding to continue the projects' development is not the only measure of success for the FoF scheme. Projects that secure further investment from other public sector funders also represent successful outcomes (e.g. Medical Research Council, Technology Strategy Board).

6.7 Risk

104. At the earliest stages of translating research ideas into practical application projects are often too risky for private sector investment. Part of the rationale for public sector investment through the FoF is to reduce risk for future investors. It is therefore important that the FoF is not too conservative when deciding which project to support. It must be prepared to take on a greater level of risk than the private sector, while still ensuring the effective use of limited public sector funds.
105. Risk is a subjective concept and it was difficult to assess the level of risk in the FoF portfolio or the FoF Committee's attitude to risk from the information provided. By supporting early stage projects, the FoF had adopted a higher degree of risk than equivalent private sector funding. However, there was probably scope for the FoF to be riskier; fewer FoF projects failed than might be expected and there were examples of

unfunded FoF applications that produced very good outcomes using alternate funding. It may be useful for BBSRC to consider risk more formally within the FoF assessment process and the application form.

6.8 Working with other funders

106. It is essential that BBSRC works with other funders to maximise the opportunities to deliver wider benefits from publicly-funded research. This includes providing funding for the earliest stages of translation as well as ensuring that there is a route for support after FoF awards end. There were opportunities for greater cooperation between BBSRC, other Research Councils, the Technology Strategy Board (TSB) and other major funders (e.g. the Wellcome Trust).
107. It is important that there are no gaps between the remits of individual Research Councils or the activities they support. BBSRC made good progress over the evaluation period to strengthen its links with other Research Councils and develop a shared understanding of the support for translation activities. Nevertheless, there is still scope for further improvement and areas remain where the responsibilities of individual Councils are not clear. It is potentially easier to develop cross-Council partnerships for translation activities compared with research grant funding, as all Councils should be interested in the co-ownership of successful translation outcomes. As a priority, BBSRC should work more closely with MRC, the Natural Environment Research Council (NERC) and the Engineering and Physical Sciences Research Council (EPSRC).
108. In recent years, BBSRC has developed closer links between the FoF and related MRC funding (e.g. DPFS) which is very encouraging. For example, the Councils are now able to transfer applications between their respective funding schemes or provide co-funding where the work crosses the remit of both Councils.
109. The interface between BBSRC and NERC is potentially more challenging. It can be more difficult to translate research ideas in these areas as they often have more limited commercial value compared to other sectors. Nevertheless, there are opportunities for research to deliver benefit to agriculture and the environment, and it is important that the Councils consider how they can work together to ensure that relevant projects are supported.

6.9 Alternative funding models

110. Over the evaluation period, the Arts and Humanities Research Council (AHRC), the Economic and Social Research Council (ESRC), EPSRC, NERC, and the Science and Technology Facilities Council (STFC) all supported their own Follow-on Fund programmes. MRC provided similar support through its Development Pathway Funding Scheme (DPFS). Recently, some Research Councils have made changes to their funding mechanisms which support the translation of research ideas into practical application. In particular, several have devolved aspects of the support to institutions. Examples include EPSRC's Impact Accelerator Accounts and MRC's Confidence in Concept scheme. Some of the new mechanisms are algorithm based whereas others retain elements of competition.

111. The Panel considered whether it would be appropriate to devolve FoF funding to institutions, noting the advantages and disadvantages of the different funding models. A move to devolved funding would create new challenges for BBSRC and host institutions. For example:
- **the administrative burden:** a devolved process shifts the administrative burden from BBSRC to the host institution and the TTO.
 - **the assessment of applications:** bioscience covers a diverse set of research area and it is unlikely that institutions could put together an assessment Panel with a greater level of expertise than the FoF Committee. It may be possible for larger institutions with specialised remits, but it would be difficult for smaller institutions or those with broad remits.
 - **the drivers to support projects:** the drivers for institutions and TTOs to support projects may not be aligned to those of BBSRC. There may be pressure for TTOs to support projects in areas where there is the greatest opportunity for a commercial return. There may be less incentive to support projects in sectors with more limited value chains or where the focus is primarily to deliver societal benefit.
 - **the balance and coverage of the portfolio:** the opportunities for BBSRC to influence the overall balance and coverage of the portfolio would be more limited in a devolved funding model. The current funding model provides greater scope for BBSRC to support the best projects from across the UK research base, irrespective of host institution.
 - **academic ownership of the application process:** the current FoF funding model provides an opportunity for researchers to 'bypass' an unsupportive institution or TTO; they can submit their application to BBSRC where it will be peer reviewed by an expert Panel.
112. In general, there was good alignment between the level of BBSRC research grant funding received by an institution and the number of standard FoF awards obtained (see Chapter 4). These data indicate that a devolved funding model may be appropriate for the FoF and could reduce the administrative burden on BBSRC. However, the application data were much more variable and there is a risk that some institutions would support lower quality or out-of-remit projects if funding was devolved.
113. On balance, BBSRC should retain the FoF scheme as part of its support for translation activities and manage it directly. It was unlikely that the FoF investment would have achieved a similar level of success through a devolved funding model. There are clear advantages in BBSRC retaining close ownership of its translational funding. It helps BBSRC drive culture change at the institutions in which it invests. It also enables the Council to be more responsive to emerging developments and consider the wider UK interest alongside the local, institutional drivers when deciding which projects to support.
114. However, BBSRC should also explore whether there are aspects of its support for translation activities that could be devolved. For example, Pathfinder application success rates are very high (see Chapter 5) and there may be opportunities to devolve this funding where institutions have a strong track record of using the support effectively. Any devolved funding model would require a monitoring process to ensure that funds were used appropriately. There would also need to be sanctions if institutions did not use the funding as intended.

115. There are examples of where devolved Research Council funding for translation activities is working well. For example, the MRC Confidence in Concept scheme provides awards to institutions which can be used flexibly to support the earliest stages of multiple translational projects and is expected to lead to successful applications for more substantive funding from MRC's DPFS scheme. BBSRC should monitor other Research Councils experiences with devolved funding to identify best practice, noting that there will be sector specific differences which must also be considered.

6.10 Awareness of the FoF scheme

116. There are opportunities to build on the success of the FoF by developing publicity materials to raise awareness of the scheme and demonstrate how researchers have used the funding. It is important that any publicity material provides a fair representation of the scheme's successes and highlights a variety of projects. It should avoid focusing only on the most successful projects as these are often outliers which may be more difficult for researchers to relate to. The aim should be to encourage researchers to consider how they could use the FoF to translate their own research ideas into practical application. It is also important to publicise how FoF support enabled researchers to determine that their idea was not suitable for further translation.

6.11 BBSRC support for entrepreneurial individuals

117. FoF support enabled researchers to develop skills and experience which support the translation of research ideas into practical application²⁶. 84% of former award holders indicated that their award was useful or very useful for developing such skills. The FoF also influenced award holders' decisions to translate other research ideas into practical application and 76% of former award holders stated that their FoF experience had made them more likely to do so. 85% of award holders had sought to translate other research ideas into practical application since the end of their FoF award; this was encouraging, particularly as this included researchers who had no previous experience of translation activities at the time of their FoF application.
118. There is scope for BBSRC to improve its support for entrepreneurial individuals. Within the FoF scheme, there is a need for greater mentoring provision (see Chapter 2). More broadly, although some BBSRC funding schemes provide valuable support (e.g. the Flexible Interchange Programme, Enterprise Fellowships), there are gaps particularly at the postdoctoral level. It would be helpful for BBSRC's Bioscience Skills and Careers Strategy Panel (BSC) and Bioscience for Industry Strategy Panel (BSI) to discuss this issue together.

²⁶ Award holders identified a variety of skills and experience that they acquired during their project. For example: developing a business plan; understanding the economics of the commercialisation project; understanding the needs and requirements of investors; understanding the regulatory environment of the technology; establishing a network of industry contacts; working with consultants; working with industry.

7. Conclusions and future perspectives

Summary

- the FoF is an effective mechanism for supporting the translation of BBSRC-funded research into practical application
- the overall performance of the FoF portfolio is impressive
- BBSRC's investment in the FoF has strong potential to deliver wider economic and societal benefits
- there are opportunities for BBSRC to improve the FoF scheme further
- BBSRC should retain close ownership of its translation funding
- BBSRC should continue to invest in the FoF scheme

119. The FoF is an effective mechanism for supporting the translation of BBSRC-research into practical application. It provides very valuable support for the earliest stages of translation projects and enables researchers to determine whether their research idea is suitable for further development. It also helps bridge the gap between BBSRC-funded research and the point at which other non-BBSRC funding becomes available. The FoF addresses a market failure within the UK innovation ecosystem and supports activities that would not be funded elsewhere within the public and private sectors. Without BBSRC's investment in the FoF, it is likely that opportunities to deliver wide benefit from BBSRC-funded research would be lost. FoF support reduces the risks to future investors, improves projects' credibility, and enables researchers to secure further funding. The FoF scheme is a vital component of BBSRC's support for knowledge exchange and commercialisation activities and complements other BBSRC funding mechanisms.

120. The overall performance of the FoF portfolio is impressive and the quality of projects is generally high. When the different facets of success within the FoF scheme are taken into account, about half of all projects could be considered 'successful' which is higher than anticipated for this type of funding model. The outcomes and achievements arising from completed FoF projects further demonstrate the success of the scheme. The projects made notable contributions to the development of IP and a good proportion licensed this IP to others. They contributed to the establishment or further development of 30 spin-out companies. They also attracted an impressive amount of further funding which was approximately three times the initial FoF investment. There is strong potential for FoF projects to deliver economic and societal benefits in the future.

121. BBSRC has adapted the FoF scheme over the evaluation to ensure it remains fit for purpose and it is important that this continued development is maintained. In general, the FoF scheme is operating very well but there are opportunities to improve the scheme further. For example, the standard FoF award duration limit is often not sufficient to enable projects' objectives to be completed and BBSRC should consider increasing this beyond the current 12 month maximum. The limited provision for mentoring is also notable gap within the scheme and BBSRC should expand its support for this activity. Award holders may lack the expertise associated with the delivery of

their project's business plan development objectives and project-specific mentoring may help improve performance.

122. There are also opportunities to improve the FoF application and assessment processes. BBSRC should explore alternative models for the FoF Committee to increase the level of expertise used to review each application. In addition, it is important to recognise that as projects progress, their further development is likely to be driven by the TTO rather than the award holder. As such, BBSRC should place greater emphasis on the interactions between FoF award holders and TTOs as part of the assessment processes. More broadly, there is a need for BBSRC to improve the reporting mechanisms to capture the longer-term outcomes and impacts that arise from the investment.
123. There were some concerns with the overall balance of the FoF portfolio. In particular, projects related to health were overrepresented and some appeared to support activities that were outside the BBSRC remit. There is a need for more explicit guidance on the types of activities BBSRC will support and for how far and how long BBSRC's support will extend. There are also some types of project that should not be supported by BBSRC (e.g. target identification for drug development). It is essential that BBSRC works with other funders to maximise the opportunities to deliver wider benefits from publicly funded research. There is scope for greater joint working between BBSRC, other Research Councils, the Technology Strategy Board and other major funders. Although BBSRC has made good progress over the evaluation period to strengthen its links with other Research Councils and develop a shared understanding of the support for translation activities, there are still some areas where the responsibilities of individual Councils are not clear.
124. Overall, the FoF is a critical component of BBSRC' support for translation activities and the Council should continue to invest in the scheme. The FoF provides effective support to enable the translation of BBSRC research ideas into practical application. It is also delivering wider benefits, for example, encouraging culture change within institutions and enabling researchers to gain important skills and experience with translation. It is unlikely that the FoF investment would have achieved a similar level of success through a devolved funding model and, as such, BBSRC should retain close ownership of its translation of its translation funding and manage the FoF directly. The scheme adds substantial value to the outcomes of BBSRC-funded research and will ultimately produce wide-ranging economic and societal benefits for the UK and beyond.