

Key messages on increasing impact from publicly funded research results

- EU research funding aims to support economic growth and answer societal challenges, however, these impacts will only be achieved through the commercial application of research results;
 - In order to support exploitation of publicly-funded results, ProBIO has screened over 400 projects funded by the FP7 KBBE Programme and found that less than 5% of them could be reasonably supported to proceed towards market exploitation;
 - A number of structural barriers exist in EU framework programmes, which take a technology-push approach thus ignoring market conditions, do not include enough commercially active partners, and do not provide full innovation process support;
 - To tackle these barriers, Framework Programme 9 should:
 - Foster more market driven RTD through substantially increased industry and SME participation;
 - Base calls for proposals for applied research projects more on strategic R&D roadmaps, developed with SMEs and industry;
 - Give more support for collaboration and demonstration;
 - Provide staged funding programmes with a longer-term implementation perspective;
 - Follow-up upon the impact of project results after the end of the grant agreements.
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ProBIO is a Co-ordination and Support Action funded by the European Union's Horizon 2020 Programme, which aims to increase the impact of biotechnology research results from the 7th Framework Programme's Knowledge-Based Bioeconomy (KBBE) Programme.

ProBIO defines impact as the use of research results in a commercial application, their contribution to policy-design, and their use as a building block for further research. The ultimate aim of EU funding for research is to have an impact, creating businesses, jobs and economic growth, as well as solving societal challenges as identified by the Europe 2020 strategy. **It is only through disruptive innovation and commercial application of results that these expected socio-economic impacts will be achieved.**

Over 30 months, ProBIO has screened more than 400 FP7 KBBE projects, looking for commercially exploitable results, and has identified and coached 69 business opportunities related to the bioeconomy. Of these, only 10 results could be helped to initiate their commercialisation by creating a Business Plan, while 46 results were guided to further research and development to achieve market readiness. **To summarise, out of 400 screened projects, less than 5% could be reasonably supported to proceed towards market exploitation.**

This document summarises the main barriers identified in the framework of the ProBIO project that hamper the societal and commercial impact of European research, and proposes five main

recommendations to overcome them. **These identified barriers and recommendations apply to projects supporting applied research (TRLs 5-9) rather than basic research (TRLs 1-4), unless otherwise noted.**

For the past ten years the ProBIO partners have recommended that funding programmes must properly address and support all stages in the innovation value chain, involving a dedicated partner for exploitation who can assess the exploitation value of research results and advise on their use.¹ **The need for dedicated expertise is supported by the findings of the present ProBIO project, but the key point of our analysis is that such support alone is insufficient, as the assumption behind the so called 'exploitation gap' of European research is wrong.** This assumption states that although the EU has excellent research, it is not turned into market success due to a lack of entrepreneurial capacity and a 'knowhow gap' concerning the needs and issues of commercial exploitation. While this has been the starting point of the ProBIO project, our finding is that there are **more complex, structural barriers** behind the low exploitation performance of European RTD programmes.²

BARRIERS

1) Too few projects generate exploitable results

Many KBBE research project results lack the innovation potential needed for commercial exploitation. The main reason is that, although the programme aimed for *breakthrough innovation*, the projects as such did not generate enough exploitable results. This is rooted in how EU R&I programmes are defined and implemented, which too often focus on projects driven by the research community, following a technology-push strategy to address societal needs, excluding market considerations from programme definition. Consequently, there is a lack of business vision and potential for commercial application as a core basis of technological development. Indeed, markets for the KBBE results often do not exist at the time of project completion, as project objectives are based on answering societal, not market, needs.

2) Lack of motivation for exploitation

The majority of research result owners are research institutions, universities and similar organisations, whose prime objective is result generation and not result exploitation. In other words, the objective behind participating in EU funded projects is to receive research funding as a way of creating new

¹ ProNano – Promoting Technology Transfer of Nanosciences, Nanotechnologies, Materials and new Production Technologies, NMP4-SA-2010-248219, 2010 – 2012; ProRETT – Promotion of Renewable Energy Technology Transfer, TREN/05/FP6EN/S07.55804/020152, 2006 – 2008.

² Based on the Call definition and the references cited therein such as the Communication of the EC 'Innovating for Sustainable Growth: A Bioeconomy for Europe'

knowledge. When a project (and accordingly the related funding) expires, the focus turns to receiving new research funding. To get exploitation funding from, for example, private investors (private equity) would divert the focus from the institutions' prime research objective.

3) Lack of business and commercial partners that can drive innovation

Another important issue is related to the composition of many consortia, which may lack a dedicated commercial partner who is committed to exploitation of the results, or may place said partner in too weak a position or role in the consortium. This is caused by call definitions that often discourage industry participation. Relevant issues are:

- Policy driven, and over-ambitious calls, which focus on societal rather than market needs;
- A requirement for wide European outreach with many different partners and little synergy;
- A focus on generic societal needs which does not foster commercially relevant results, since societal needs are often not (yet) market needs;
- Unrealistic requirements of impact on societal goals, environment, growth, jobs, coherence and more, all in the same project.

Although a lack of entrepreneurship is often cited as a key issue inhibiting research exploitation, Europe does in fact have a strong entrepreneurial streak, including many companies, and especially SMEs, which should be ready to exploit RTD results because of their need for innovation and competitive advantage. Yet, neither EU policy nor the research community are yet setting up research projects that support them and meet their needs, giving them access to the research results that they need to grow.

4) Complexity of innovation process not well considered in programme set-up

The complexity of the innovation process chain in generating breakthrough innovations and reaching the market is often not sufficiently considered in programme and project set-up in a way that can achieve the EU's political priorities. The key issue is that typically more than one R&I project is required to generate results that are ready for successful commercial exploitation. The innovation process chain from basic research to demonstration and finally to market exploitation is not seamlessly covered in European R&I funding. Too many gaps are persisting between the different steps of technological development required to reach the market. **Moreover, a significant lack of funding is still observed especially for TRL 7-9 development; substantially more funding is required, especially for piloting & demonstration phases.**

5) Need to reshape evaluation and project implementation procedures

There is a substantial need to reshape the ways and procedures by which the EC evaluates the impact side of submitted EU proposals, and assists impact generation of EU funded projects. The expected

impact from a project is not always clearly defined in the call text, and is often overly ambitious, causing difficulties for both applicants and evaluators. Evaluators usually do not have sufficient knowledge of market expectations, and are thus unable to judge exactly what the potential socio-economic impact of a project could be.

RECOMMENDATIONS

- 1) **Foster more market driven R&I through substantially increased industry and SME participation** – for example, through the joint technology initiatives and similar approaches;
 - 2) **Base calls for proposals for applied research projects more on strategic R&I-roadmaps, which are developed jointly with industrial companies including SMEs** both in a top-down and bottom-up fashion. An example for bottom-up project definition could be through cluster-facilitated R&I projects that are based on strategic R&I roadmaps which have been developed jointly by groups of SMEs and research teams collaborating in regional or national SME driven clusters;
 - 3) **More support for collaboration and demonstration** by ensuring the participation of industrial technology developers and end users in the development phase of a project;
 - 4) **Provide staged funding programmes for research and innovation actions with a longer-term implementation perspective** – A new programme design with ‘staged grants’ could address TRL 4-6 in a first project stage and TRL 7-9 (piloting and demonstration) in a second project stage. Both stages would need to be included in one Grant Agreement, but the grant for Stage 2 would be conditional upon achieving well-defined exploitable results in Stage 1;
 - 5) **Follow-up upon the impact of project results after the end of the grant agreements** – Make access to funding for further projects conditional upon successful use of previous project results. For basic research, this could involve the publication of results, intellectual property and evidence of follow-up research. For applied research, this would require evidence of commercialisation efforts.
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