



European Research Council

Scientific Council

Established by the European Commission

## **An Empirical Assessment of the ERC Proof of Concept Programme**

### **ERC Scientific Council: comments to the final report and the recommendations**

The ERC Scientific Council strives to constantly improve the quality of its operations and to monitor whether the ERC mission is being fulfilled. In these efforts, and reflecting current global best practice in the evaluation of public policies for research and innovation, in 2016 the ERC assembled a group of independent experts<sup>1</sup> to review the impact of the ERC Proof of Concept grants (PoC). The group consisted of eight experts bringing together complementarity expertise in technology transfer and government measures to encourage the development of new technologies; monitoring and evaluation of research and innovation funding programmes; implementing research and innovation funding programmes; investing in science-based ventures. The experts were familiar with ERC and the European Research Area-related policies. Specific expertise at the level of various areas of application of science-based innovations (Physical Sciences and Engineering, Life Sciences, Social Sciences and Humanities) was also available in the case of some experts.

The assessment, conducted during 2017, aimed to provide qualitative and quantitative information and analysis on the current and expected performance of the PoC awards as well as to monitor the fulfilment of the PoC mission, i.e. demonstrate the commercial and societal potential of ERC bottom-up selected frontier research projects. The study findings were intended to inform the ERC Scientific Council's decisions on the performance to date of the PoC awards and identify potential improvements to the current approach.

In this exercise, great importance is given to the views and experiences of numerous researchers who respond annually to the Call for proposals to the various ERC grants. Their feedback on ERC procedures and the perceived quality of service that ERC offers provides a basis on which to assess whether the ERC is meeting researchers' expectations, and to help make adjustments if needed

The goal of the study was thus to better understand how well the PoC scheme meets the objective to facilitate the work of a those ERC grant holders who seek to investigate the commercial and societal potential of their research. To this end, the study focused on a series of interrelated dimensions. These include awareness and knowledge of the PoC

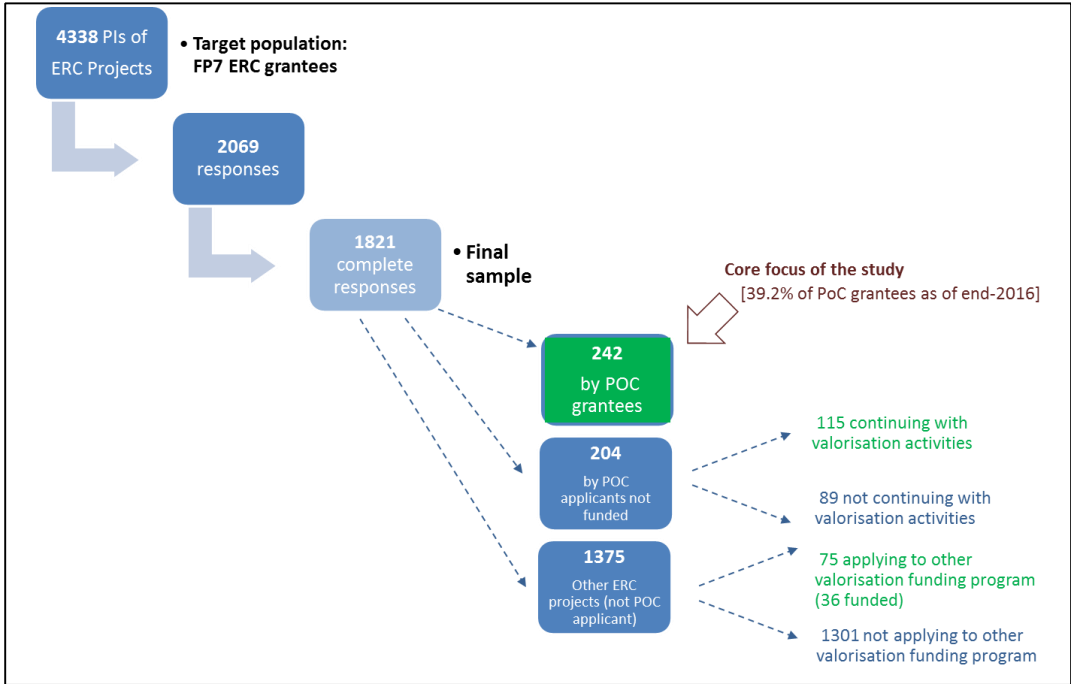
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<sup>1</sup> The Group of Experts included: Charles Wessner, Georgetown University (Chairman of the group); Federico Munari, University of Bologna (Vice-Chair); Athanasios Alevizopoulos, Therapten Biosciences Inc; Marta Catarino, TecMinho; Joachim Hafkesbrink, Innwise Reseach & Consulting GmbH; John Scanlan, Maynooth Univeristy; Karen Laigaard, University of Copenhagen; Hans Brouwer, Nascent Ventures.

existence by ERC grantees, participation and activity in the programme, and the impact of the PoC scheme and its effect on PoC projects. Although it is already possible to determine some of the intermediate outcomes of the awards, such as licensing agreements, R&D contracts, consulting agreements, public engagement, additional funding, and the creation of spin-off companies, the time elapsed between the award and the study is not sufficient for a full assessment of the awards' impact. The relatively recent implementation of the PoC programme means the bulk of the awardees are not yet at a stage where the broader impacts in terms of market penetration, tax revenue, job creation, and societal benefits can be fully determined. Given this reality, the evaluation presents the achievements to date of the awardees and their assessment of their prospects for future progress and illustrates individual cases where substantial success has already occurred.

The study methodology was mainly based on a survey to all 7th Framework Programme (FP7) ERC grantees, i.e. the PIs of all FP7 ERC main (frontier research) grants, as potential applicants to the ERC PoC funding scheme since its initial creation. As a counterfactual for the assessment of ERC PoC projects (the core focus of the assessment), the survey also targeted a control group of other ERC frontier research projects, including a set of projects that applied for an ERC PoC grant, but were not funded and continued valorisation activities and a set of projects that never applied for PoC but used other valorisation funding sources (non-ERC). In addition, 33 interviews were conducted separately with PIs of selected PoC projects to complement the survey, providing the opportunity to discuss some of the projects in depth in order to better understand the process that takes ERC PoC grantees towards the valorisation of their ideas.

Figure1 – A representation of the survey responses



The report of the independent experts is available here: [https://erc.europa.eu/sites/default/files/document/file/poc\\_review\\_report.pdf](https://erc.europa.eu/sites/default/files/document/file/poc_review_report.pdf)

The main conclusions of the study were that the programme is sound in concept and effective in practice. By most measures, from awareness, to IP creation, to company creation, to additional funding, it is performing very well indeed. This reflects in no small part the underlying quality of the ERC funded research and its potential for commercial and societal impact. Importantly, the programme's positive impact in terms of mind-set and confidence among the researchers is potentially one of the more enduring impacts of the awards, contributing to a cultural change among the research teams.

At the same time the report also provides a welcome opportunity for the ERC to consider how to provide an even better service. The report contains valuable recommendations by the independent experts, based on the survey respondents' suggestions, on how to improve the quality of the ERC operations.

As the independent experts explain in the report, even successful programmes can be improved. Recommendations proposed comprise measures such as more flexibility for the PoC project, the need for additional funding, greater outreach to industry, including mentoring and opportunities to meet potential investors. Other suggestions include enlarge the pool of expert evaluators to include expertise in early-stage finance and start-ups. Steps could also be taken to facilitate a clear path for PoC awardees to other EU programmes. High potential PoC projects and companies would represent attractive targets for the ambitious instruments for disruptive innovation proposed by the European Commission with the European Innovation Council (EIC).

The recommendations are valid and appropriate as a menu of options for the ERC Scientific Council to consider as policy changes that would benefit PoC grantees. Some of the suggested improvements had already been implemented at the time of the survey, others might be considered by the Scientific Council for immediate or future implementation.

In the following pages the Scientific Council reflects further on the lessons learnt from the survey and the recommendations and indicates what the ERC will undertake in the coming months to further improve the level of its services, taking into consideration among others the views and feedback collected in this survey.

The Scientific Council is very grateful to the independent experts who performed the assessment and to the grantees who took time out of their busy schedules to take part in the survey and share their views and experiences with the independent experts and ultimately with the ERC.

## I - SURVEY FINDINGS

### ***High awareness of the ERC PoC programme***

Only 13% of the 1375 non-PoC applicants state that they did not apply because they were not aware of the ERC PoC programme. Among the respondents that did not apply, the decision not to do so was mainly because their priorities remained focused on research activities (54.6%) or because their frontier research project had not yet generated opportunities for commercial/societal valorisation (38.9%).

**The Scientific Council** considers the evidence about awareness as the result of the successful activity of the ERC Executive Agency (ERCEA) to inform grantees about the PoC funding opportunities and strongly support the continuation of this direct communication channel.

It also note that the evidence on the reasons for not applying to PoC grants reflects the characteristics of the great majority of ERC-funded researchers who are pursuing curiosity-driven research and are not motivated by a commercialisation goal.

### ***High levels of satisfaction with the process***

The survey responses from PoC grantees suggest that the selection and evaluation process has worked efficiently in the past. The survey evidence on the valorisation outcomes of PoC grantees vis-à-vis PoC applicants not funded also speaks in favour of the efficacy of the selection process.

The assessment of the usefulness of the feedback from the selection process from non-winners is less positive. This suggests an area of improvement.

### ***Motivations to apply***

ERC grantees apply to PoC mainly to develop projects focused on issues related to technical validation and demonstration, with most important objectives for the projects being related to verifying the technical feasibility of novel ideas/technologies and to developing prototypes/test data in a research environment, i.e. in the lab compared to other more "close to market" activities.

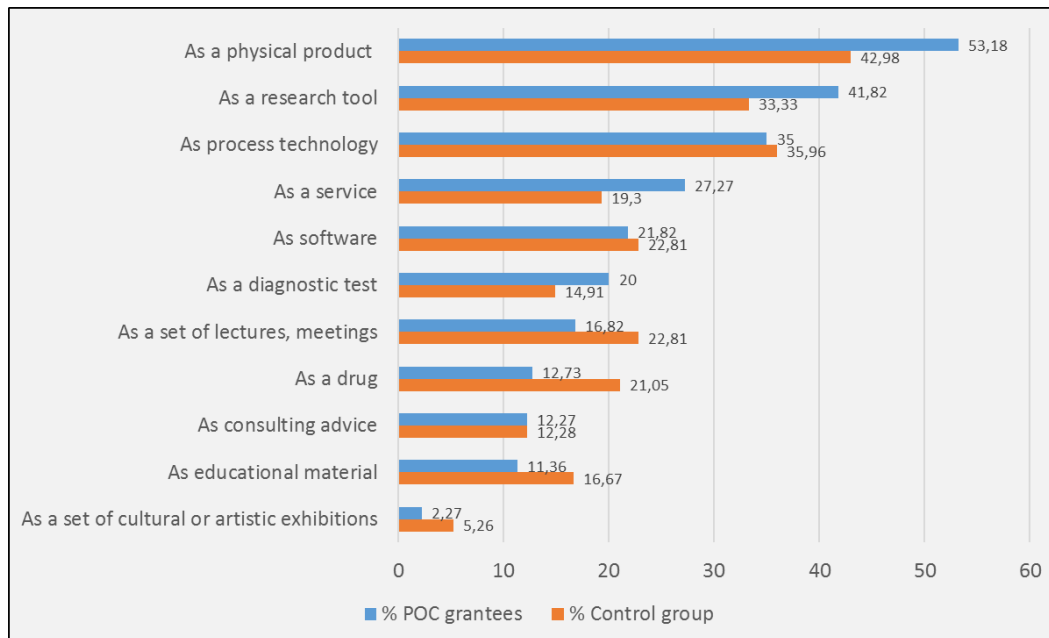
**The Scientific Council** considers this evidence as being perfectly in accordance with the PoC scheme objectives, showing that PoC projects tend to be in the very early-stages of the technology or knowledge transfer path, mostly focusing on significant technical challenges and in general still distant from market and societal applications.

### ***Activities and outputs***

**Evidence of additionality of the ERC PoC programme:** A significant 43.6% of respondents that applied to the ERC PoC programme but were not funded reported that they

discontinued valorisation activities for the idea/technology at the basis of the submission to the PoC programme. These responses underline the triggering role of the ERC PoC grant for the actual undertaking of valorisation activities.

**Generating a variety of projects' outputs:** As illustrated by the figure below, the survey shows that a very diverse set of outputs emerged (or are expected to emerge) from ERC PoC projects.



**The Scientific Council** reflects on the fact that PoC projects mention with relatively lower frequency (as compared to projects within the control group) expected outputs related to educational materials or cultural/artistic exhibitions. This could be a result of a low participation of SH grantees in PoC. An analysis conducted on PoC in FP7 showed that SH frontier research projects generated fewer PoC applications (7% of PIs holding an SH grant applied for a PoC) than projects in the other two domains (12% in LS; 13% in PE) and PoC proposals originating from SH projects are less successful (21% success rate) than those originated in the other two domains (27% in LS and 41% in PE). An analysis of the reason for the low participation to and low success rate of SH grantees in PoC in FP7 has already been performed by the ERCEA. The Scientific Council suggests extending the analysis to H2020 in order to implement corrective measures, if necessary.

The fact that PoC grantees mention expected outputs related to drug development with significantly less frequency than the control group seems to indicate that the ERC PoC is not seen as instrument for valorisation of ideas in this area of research, which could be expected considering the amount of the grant and the time allocated to PoC projects.

**Clarifying valorisation strategies.** The ERC PoC project serves as an important opportunity for the identification and finalisation of a valorisation strategy for the idea/technology. Indeed, more than 30% of ERC PoC grant holders responded that they did not have a valorisation strategy at the beginning of the PoC project, whereas that percentage drops to almost 11% at the end of the project. As illustrated in the table below, the most frequently mentioned valorisation strategies refer to (in decreasing order of frequency): Licensing agreements; Collaborative R&D agreements; Release of usable knowledge in the public domain; Creation of a new company.

Answer Options	At proposal submission	At the end of project
We did not have a valorisation strategy	67	23
Release of usable knowledge in the public domain	35	84
Licensing agreements	44	101
Collaborative R&D agreements and R&D contracts	48	98
Consulting	39	50
Creation of a new company	49	81
Input to public institutions (including governments, standardisation bodies, regulatory bodies)	20	42
Advice for NGOs, charities and other civil society organisations	12	19
Other	4	6

Number of responses: 222 by POC grantees (multiple responses possible).

**The Scientific Council** is satisfied to see that the PoC serves as an important opportunity for the identification and finalisation of a valorisation strategy and note that the fact that the creation of new companies is not the most cited valorisation strategy by ERC grantees at the end of the project points at the importance of other follow-up actions than scaling-up start-ups in the process of taking disruptive technologies from the lab to the market.

**Valorisation outcomes**

The achievement of valorisation outcomes by ERC PoC projects were analysed via the survey in terms of:

- Creation of IPRs
- Licensing agreements
- R&D collaborations/R&D contracts
- Consulting agreements
- New company formation
- Public engagement

**High likelihood to generate patent applications:** PoC projects have a higher likelihood of generating new patent applications and new patent grants when compared to the control

group. On average, more than 42% of the PoC projects report at least one patent application as a result of the valorisation project, as compared to 17% of the control group.

**Significant licensing activity:** The likelihood of a licensing agreement as a result of the PoC project is significantly higher (17.3%) than in the control group (9.3%).

**High number of new companies created:** 45 PoC grant holders (representing 20% of all responses by PoC grantees) report in the survey that their valorisation project led to the creation of a new company, while only 8 respondents in the control group (6.4% of cases) report such an achievement. New companies generated through PoC projects are of a very small size, declaring a median number of 3 employees.

**Early indicators of pretty small commercial activity:** Around half of the new companies linked to ERC PoC projects report that they were able to generate actual sales, but around 52% of such income-generating new companies declare total sales below 100,000€.

**Contribution to policy-making:** in 49% of cases, PIs or project members were involved in expert panels or policy committees, in relation (at least in part) to the PoC projects' results. In 20% of responses from ERC PoC grant holders, the project results were mentioned in documents or reports by governments, ministries, national or regional agencies, thus serving as a source of inspiration in the policy decision-making.

**The Scientific Council** believes that these results confirm that the PoC is the appropriate tool as a valorisation path for frontier research, comparing the outcomes of PoC projects with those of a control group. The final outcome of PoC funding in terms of technology transfer activities seems to demonstrate that PoC grantees are more successful in terms of higher technology transfer outcomes as compared to the control group.

### ***Access to additional funding***

The ability to attract additional funding for the further development of an idea/technology related to the ERC PoC award is a key market-based indication of the value of the project.

**Moderate ability to attract additional funding:** While around 70% of ERC PoC grant holders indicated that they sought to obtain additional developmental funding, only 38.7% of them were successful, a percentage not significantly higher than in the control group (35.6%).

**More public than private sources for follow-on funding:** Out of the 73 projects in the group of ERC PoC grantees that reported the amount and source of additional funding, around 88% obtained it from public sources and around 44% from private sources (multiple responses possible).

**Use of additional funding:** The two most frequently cited reasons by ERC PoC respondents to search for additional funding are represented by the necessity to conduct "Further development and testing" of the product/process/service (78%) and the need to conduct "Further research activities" (58%) (multiple responses possible).

**The Scientific Council** notes, in agreement with the conclusion reached in the report, that the fact that public sources still represent by far the most frequent source of follow-on funding for PoC projects is a confirmation of the early-stage nature of ERC PoC projects, and their need to further de-risk the technologies before they are likely to receive additional private funding. It is also a confirmation of the strong link of these projects with the original frontier research nature of the main grant.

The need of further long-term, high-risk investment is also confirmed by the intended use of additional funding, which seems to be requested mainly to address further technical challenges.

### **Skills development**

**Improvement in valorisation skills - more confident about valorisation:** On average, ERC PoC respondents report high levels of perceived improvement in the commercial and business development skills of project members as a result of the valorisation project. The PoC made the project members significantly more aware of and confident about valorisation issues at the point that 68% of PoC grantees declare that they would now feel definitively more capable of taking on a valorisation project for another new idea/technology.

**The Scientific Council** notes the contribution of PoC to a change of culture, in the sense of encouraging academics to take forward commercial (valorisation) as well as academic opportunities and by steering the talent of curiosity-driven researchers towards having a societal and economic impact, when appropriate.

## **II -SUGGESTIONS FOR IMPROVEMENT AND RECOMMENDATIONS**

At the end of the questionnaire, 81 PIs responded to a final qualitative question on how to improve the ERC PoC funding scheme:





Based on the results of the survey and statements made by the experts as a result of the interviews, and the analysis of the report's authors, the following recommendations were put forward for consideration by the Scientific Council:

### 1. **Provide Additional Investment by the ERC in the Most Promising Projects:**

1.1. **Follow-on Awards:** have the ERC make funds available for a second round of funding in a subsequent round of PoC grant as a sort of continuation award, made competitively within a limited pool of PoC funding.

1.2. **Matching Funds:** challenge promising PoC awardees to seek private sector funds which could then be matched by the ERC or from a related institution. The match could be a one-to-one or differentiated depending on the amount of the private investment.

1.3. **More Cooperation with Other European Institutions:** facilitate a clear path for PoC grantees to other EU programmes, ideally on the basis of a formal agreement with

- the European SME Instrument, Fast Track for Innovation or with an arm of the European Investment Bank.
- the pilot European Innovation Council (EIC) appears as a natural potential partner.

1.4. **Programmes in Member States:** develop pathways for PoC awardees to national and regional investment programmes via collaborative arrangement where the PoC program might make available limited additional funds on the condition they are matched on a two-to-one or three-to-one basis by Member State institutions and programs, or the private sector.

- **The Scientific Council appreciates that the PoC funding represents just the initial step to help the transfer of new ideas from the lab to where they can be applied, further developed, and possibly used and commercialised. There is a very high inherent risk in these projects, and high gain if they succeed, but further patient capital and time will still be required for these knowledge and technologies to be scaled-up. The EU Framework Programmes have been active in establishing instruments and programmes to improve the transfer and economic exploitation of the results of EU-funded research and there are indications that this will be further strengthened in the successor of H2020, in particular with the establishment of an EIC. The Scientific Council will therefore discuss these recommendations at a later stage, once the funding instruments and support mechanisms for the next FP are defined.**

2. **Additional Time:** Having a process which could allow a nearly automatic extension for a properly justified request could prove valuable in more fully achieving the goals of the awards (either via “no-cost extensions” or by applying for additional time and resources with adequate justification). As a general proposition, adding flexibility in managing the development of new products, processes, and companies should be fully considered.

- **The Scientific Council notes that this suggested improvement had already been implemented at the time of the survey. The duration of the PoC projects was increase from 12 to 18 months in Work Programme 2014 with the following text: "The ERC expects that normally, proof of concept projects should be completed within 12 months. However, to allow for those projects that require more preparation time, projects will be signed for 18 months. Given this initial flexibility, extensions of the duration of proof of concept projects may be granted only exceptionally".**
- **With regard to adding flexibility, the Scientific Council has decided that in the last two years of H2020 the PoC shall take the form of a standard lump sum pre-fixed by the Commission. Compared to the present system based on reimbursement of actual costs, lump sums provide considerable simplification potential, removing all obligations on cost reporting and financial audits, thus eliminating a major part of the administrative burden on beneficiaries and enabling efficiency gains in the implementation.**

**3. Programme Replication:** encourage national authorities to create similar competitive awards for leading researchers within their national or regional frontiers. The PoC might also consider deploying a Seal of Excellence, drawing on the successful experience of the SME Instrument.

- **The Scientific Council welcomes the recommendation and note that several national authorities have already created national competitive awards similar to the ERC PoC and are willing to encourage other national authorities to do so, but it is entirely up to them take this decision. The suggestion to deploy a Seal of Excellence for the ERC PoC had already been implemented at the time of the survey and will become operational in the near future.**

**4. Outreach to the Private Investors:** organise workshops and forums to present promising PoCs to potential private sector investors. If organised by sector and by region, they could help enlarge the awareness of the quality of PoC awardees and of the potential investment opportunity.

- **The Scientific Council notes that the ERCEA has been regularly organising this type of events since 2013, following different formats and fora with private investors. Despite the great interest of a limited number of PoC grantees and the enthusiastic comments of few investors on the quality of the PoC projects, it has proven to be difficult to attract PoC grantees to these types of investor events and very few concrete contacts have been established between grantees and investors. It might be because PoC projects are at such an early stage of development that it is too early for them to meet investors. The Scientific Council suggests a more in-depth analysis of this in order to better organise these events, taking into consideration the suggestion to focus the events geographically and by sector. The Scientific Council will also analyse possible**

**alternative ways to support PoC grantees in getting in direct contact with potential investors.**

**5. Connect to highly-qualified mentors and coaches:** promote a network of mentors who could assist in company creation and product generation, leveraging on existing successful communities of qualified mentors/coaches, at the EU or national level that could be signalled to PoC awardees as opportunities, leaving them the choice to select, if of interest, the most appropriate partner for collaboration.

**6. Entrepreneurship Training:** organise one or more annual valorisation “bootcamps” focused on helping PoC researchers understand how they might bring their ideas and technologies from the lab into the marketplace and more broadly to society.

- **The Scientific Council welcomes these recommendations and are aware of the needs expressed by PoC grantees for mentoring, coaching and entrepreneurship training. The opportunity to be involved in such activities has already been discussed in the past, but the Scientific Council considered it outside the mission of the ERC to fund them. As for under point 1 above, the Scientific Council will discuss these recommendations at a later stage, once the support mechanisms for the next FP are defined.**

**7. Maintaining Communication:** maintain a communication channel between the Agency and the PoC grantees for the exchange of updated information on upcoming calls and other programme opportunities, but also for further assessments of awardees progress over time.

- **The Scientific Council welcomes this recommendation and invites the ERCEA to maintain and reinforce the communication channel with the PoC grantees, possibly including also the organisation of PoC events, PoC grantees networks and alumni, etc. .**

**8. Continuously Improve the Selection Process:** two steps to improve the selection process might include:

- **8.1. Enlarge the pool of experts evaluators** by including experts with a background in early-stage finance for small companies and start-ups as a means of strengthening the valorisation perspective in the selection process
- **8.2. Improve evaluators’ remuneration:** increase the remuneration for the evaluators to better reflect the effort required for the assessment of what are often complex proposals, nor do they seem sufficient to motivate the continued involvement of evaluators.

- **The Scientific Council is of the opinion that including experts currently active in investing in early-stage small companies and start-ups could create conflict of interest and compromise fairness and transparency of the evaluation process and are therefore very reluctant to implement this recommendations.**

**9. The Need for Ongoing Assessment:** subsequent assessments of the PoC should be undertaken on a regular basis to ascertain further progress initiated by the programme's awards and develop a better understanding of likely trajectories and needs of the PoC awardees, their teams and the companies they have created.

- **The Scientific Council welcomes this recommendation and will reflect on ways and timing of its implementation.**