

Zurich's Research Intensive Universities and FP9	
Context	Position of ETH Zurich and the University of Zurich (UZH)
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Introduction

Since 1988 researchers based in Switzerland have been participating in the EU Research Framework Programmes: Until 2004 Swiss project participations were directly funded by the Swiss government and Switzerland had the status of third country. Between 2004 and 2014 Switzerland was privileged to be fully associated to the FPs of the EU. For 'Horizon 2020', Switzerland was unfortunately considered as a partially associated country until the end of 2016 after the Swiss popular vote on the limitation of mass immigration on 9 February 2014. ETH Zurich and UZH are therefore delighted that as of 1 January 2017 Switzerland has been again fully associated to the entire Horizon 2020 programme.

Ever since 1988 researchers from UZH and ETH Zurich have extensively participated in projects of the respective FPs. When the European Research Council (ERC) was established in 2007, Switzerland soon became the most successful country participating in the new ERC schemes. ETH Zurich and UZH highly appreciated the increase of the ERC's budget in Horizon 2020, strongly advocating its significance for basic / fundamental and frontier research for all levels of a researcher's expertise.

As Switzerland supported the New Member States (NMS) of the European Union between 2009 and 2016 via a dedicated Swiss Contribution and successfully implemented a Scientific Exchange Programme, UZH and ETH exceedingly welcomed the Teaming & Twinning activities of H2020. Furthermore the institutions acknowledge the efforts of the EU to simplify the administration of EU projects namely via the improvements of the EC's Participant Portal as well as the EC's flexibility when it comes to the adaptation, modifications and consultations of Work Programmes.

In the recent EC publication "Results of Horizon 2020 Stakeholder Consultation – Interim Evaluation of Horizon 2020" it was clearly stated that "the current pillar structure improves the clarity of the programme but linkage among the pillars should be enhanced (...)" (p.52) and the need "to ensure a good balance between research and innovation (...)" (p.53). ETH Zurich and UZH strongly support these views – as it has also been emphasised in their mutual position paper submitted on the occasion of the Interim Evaluation of Horizon 2020. The focus of this document is the further elaboration of amongst other these main aspects of a future Framework Programme for Research and Innovation from the point of view of two Swiss research intensive higher education institutions.

For UZH and ETH Zurich the key characteristics of an upcoming FP include:

- *Ensuring and integrating more collaborative basic/ fundamental research*
- *Ensuring the innovation pipeline by better supporting use-inspired basic research*
- *Ensuring research funding that is open, flexible and based on trust. Elaborated Work Programmes are not necessary*
- *Ensuring robust, fair and fast evaluation by introducing standing evaluation panels and clear evaluation criteria - both along the United Nations' Sustainable Development Goals (SDGs)*
- *Ensuring achievable and real impact*

Structure

ETH Zurich and UZH strongly support the simple and clear three pillar structure of Horizon 2020 and recommend to maintain this simplified approach in the upcoming programme, though with the following slight modifications and extensions:

Pillar 1: Excellence Science

The ERC and FET scheme have been highly successful because they allow for **ground-breaking and high-risk** basic/ fundamental research, for experimentation without a guaranteed success, for providing sufficient funding and granting researchers **independence not only within their research but also from restricting requirements**. In order for Europe to improve its capacity for innovation UZH and ETH Zurich are convinced that **global openness will be crucial** also within this Pillar, i.e. funding opportunities for non-European partners with institutionalised links to Europe.

Pillar 2: Innovation Leadership

In this pillar the current *SME* and *Access to High Risk* instruments would be included as well as a new comprehensive **Proof of Concept scheme as a follow-up funding instrument** for ERC, FET and collaborative projects (from Pillar 3 et.al) with a potential of being successfully exploited together with significant stakeholders. Eligible for this newly to establish scheme would be previously EC-funded research projects/consortia from Pillar 1 **and** 3 as well as previously nationally funded research projects in search of **validation and demonstration** of their outcomes in the relevant environment and with the relevant stakeholders respectively on a European/international level.

Pillar 3: Global Challenges

This pillar would focus on the 17 SDGs, which cover all the pertinent research questions that are gathered both in Pillar 2 (Industrial Leadership) and Pillar 3 (Societal Challenges) in H2020. Eligible would be collaborative research projects while funding should be equally balanced between use-inspired basic research and application oriented research.

Ensuring and integrating more collaborative basic/ fundamental research into the future Pillar 3

There is no innovation without basic research, without basic knowledge. Innovation is the process to introduce new ideas and dynamics to continually feed any evolving system, also when they fail or stagnate.

Multi-national and multi-disciplinary collaborative projects have proven to be a key success factor of the European Framework Programmes: They allow for international and inter-sectorial collaboration, they spur innovation, guarantee knowledge and technology transfer, encourage creative thinking and create long-term

collaborations far beyond the life-cycle of a project. To forge even better links not only between university research laboratories but also with companies, there need to be more room for bottom-up, collaborative research in the EU's framework programme. It is essential that top-down (i.e. politically pre-defined research topics) and bottom-up (i.e. science-driven research topics) calls are well balanced in the future programme. It should not be forgotten that the investigators and their curiosity define and drive the state-of-the art in all sciences. They are the cornerstone for every innovation process.

UZH and ETH Zurich highly appreciate the current FP's openness to any natural persons or legal entities regardless of their place of residence or establishment. However, if the EU's Innovation Union Scoreboard (IUS) Indicator should reach the United States' innovation level in the coming years, the future FP needs to fund non-European research centres that have an institutionalised link with Europe. Innovation like science and research should not and cannot be constrained by borders.

Ensuring the innovation pipeline by better supporting use-inspired basic research

As mentioned in the section above, fundamental research is crucial for feeding the innovation pipeline. The extraordinary value of fundamental and use-inspired basic research for the long-term innovation pipeline needs to be not only recognised but also strongly supported by the EC: Not only investments in basic research but also specific measures and support mechanisms for exceptionally talented innovative researchers have to be implemented in the upcoming FP. ETH Zurich and UZH are convinced that the upcoming FP can play an essential or even pioneering role when it comes to supporting and reinforcing a sound basis for an innovative, creative, sharing and open Europe.

Therefore the EC needs to ensure, facilitate and enhance via its FPs the knowledge and technology transfer on all levels between academia, society, policy and industry. To achieve this UZH and ETH Zurich recommend to implement **a comprehensive Proof of Concept funding scheme**, which supports the validation and demonstration of research outcomes from Pillar 1 and 3 projects as well as from nationally funded projects, thus allowing for an effective exploitation of research results as well as supporting and facilitating the realisation of further reaching impact. As a model we would recommend the highly successful *Pioneer Fellowships* of ETH Zurich, the *UZH BioEntrepreneur-Fellowships* and the *BRIDGE Programme*, managed commonly by the Swiss National Science Foundation (SNSF) and the Swiss Commission for Technology and Innovation (CTI), as from 2017 InnoSuisse, the Swiss Agency for Innovation.

In addition, this Proof of Concept funding scheme should be complemented by **tailored support measures** like advice for the foundation of spin-offs and start-ups when it comes to Intellectual Property Rights (IPR), business plans, international business development, venture capital and scaling up strategies. The EC needs to accompany promising ventures via mentoring, coaching, networking and clustering opportunities, for example, by supporting European Innovation and Entrepreneur Labs. Furthermore, it could be considered that successfully supported spin-offs/start-ups receive a European label.

Ensuring research funding that is open, flexible and based on trust. Elaborated Work Programmes are not necessary

ETH Zurich and UZH strongly believe in the power of science, research and innovation. Multi-national and multi-disciplinary research activities have resulted in disruptive innovations in the past. By allowing research consortia to submit bottom-up proposals answering a specific SDG (see also section on evaluation), **without any pre-defined work programmes** and calls open throughout the year with several cut-off dates, it is very likely that all relevant and important contemporary research areas and topics will be covered.

UZH and ETH Zurich specifies the terms ‘basic’ and ‘bottom-up’ research as follows:

- **Basic/ fundamental research** generates new ideas, principles and theories, which may not be immediately utilised but nonetheless form the basis of progress and development in different fields.
- **Bottom-up research** includes all types of research activities: basic/ fundamental, use-inspired basic and application-oriented research **but not** contract research or research beyond Technology Readiness Level (TRL) 6 (TRL as defined for H2020 in the Work Programme, general annex G).

For Zurich’s higher education institutions it is important that public funding of FP9 focuses on **leveraging co-investments from companies in areas where they can derive real future competitive advantages instead of covering their R&D needs/activities thus substituting private investments**. In FP9, bottom-up collaborative projects should refer to defining a pertinent research topic answering one or more SDGs.

Ensuring robust, fair and fast evaluation by introducing standing evaluation panels and clear evaluation criteria - both along the United Nations’ Sustainable Development Goals (SDGs)

The evaluation system of the upcoming FP has to be **robust, fair**, as **fast** as possible and based on a process that is **clear and transparent** both for evaluators and proposers. Adequate feedback needs to be provided to the proposers in order for them to understand the evaluation of their proposal and consequently being able to improve the project idea in the future. This was also mentioned by many respondents in the mid-term evaluation of H2020.

The **main aim of the evaluation process** in all three pillars of FP9 is to ensure that only “**excellent**” projects are being funded. In other words: Research activities funded by the European Union need to be executed in high-quality **and** need to be relevant. This includes incorporating appropriate, validated and cutting-edge methods in the proposal **and** describing results with the potential of becoming valuable, pertinent or useful in the near future. Consequently “excellence” is located where ‘high-quality’ encounters ‘relevance’.

In **Pillar 1** (specifically within the ERC and the FET programme) “excellence” means that the proposed frontier research activity has to be novel, non-incremental and beyond state-of-the art as well as based on a plausible outline and an appropriate methodology. In both programmes, ERC and FET, the main focus lies on gaining new knowledge **within** the respective science / technology field. In addition, the FET programme also insists on the importance for later exploitation and should therefore be chosen highly selectively.

The overall aim of the new **Pillar 3 “Global Challenges”** should be to fund basic/ fundamental, use-inspired basic and application-oriented research activities that provide new knowledge with the potential of becoming pertinent not only within academia but also **beyond** academia. In this Pillar 3 “excellence” explicitly includes the consistency of the research outcomes for relevant stakeholders such as industry, business, policy and

society at large. Consequently the proposed **evaluation criteria** for the future Pillar 3 should be the following:

- **Attainable and Relevant Research Questions:** Taking all relevant previous and current (academic) research and knowledge adequately into account. Defining an independent research question that can be answered in its own right. Ensuring that asking and answering the research question provides a potential for impact within **and** beyond science.
- **Context Sensitive and Impact Oriented Research:** Considering the needs and interests of potential stakeholders within **and** beyond academia as well as the costs and benefits to them. Engaging in, or supporting and facilitating the realisation of further reaching impact as well as the exploitation of outcomes.

The **SDGs should be the baseline in the future Pillar 3 of FP9** against which the pertinence and potential impact of the proposed research activities are going to be evaluated. Both the research questions and the expected impact therefore do not have to be pre-determined in work programmes anymore. In thematically open calls, project consortia define their **own** non-trivial research question and choose the panel (see below) to whom they submit the proposal.

In order to have evaluation experts being fully committed, we suggest to establish **standing evaluation panels for Pillars 2 and 3** along the lines of the ERC model. For Pillar 3, we propose to establish a panel for each of the 17 SDGs with subsequent sub-panels. These panels are preferably mixed, with experts representing academia and relevant stakeholders.

Ensuring achievable and real impact

As outlined in the section above, the SDGs would be the leading principles for defining the evaluation panels. As the consortia would submit their proposals (including the PoC-proposals) to a specific panel, also an expected long-term impact would automatically apply: namely the respective SDG. Thus an impact definition by the EC would be automatically eliminated. Independent from this long-term impact it would be up to the consortia to define the impact of their project explicitly for the duration of the project and the immediate expected impact once the project has been completed. This expected impact should be realistic, measurable and clear (see above, evaluation criteria "Impact oriented and fair").