FET: The Engine of pan-European Research and Innovation Effort

FET Advisory Group
January 2018

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A Strategic Advisory Brief prepared by FETAG
January 2018

For centuries, Europe was a pioneering force in science and technology. Today, although still very strong in fundamental research, Europe has lost her pole position as a technological trend setter, initially to the USA, but now also to Asia. Effective translation of fundamental research into emerging technologies is the cornerstone of new disruptive industries that in turn create enormous wealth and employment, and attract talent. Europe, therefore, has lost out in capitalising on research excellence. A simple demographic comparison with the USA indicates a dramatically large deficit of about 1 mln researchers, especially in business orientated research.

Facing these dramatic challenges coming from Asia and the USA, European research must become again the most dynamic R&D location in order to attract and retain the most talented researchers and entrepreneurs. It is clear that in parallel to national strategies, the EU community at large should enrich the offer, especially in high-risk technological areas, but also paying very high attention to societal aspects. Such programs should address the European research avant-garde and become the heart of future Framework Programs. They must be flexible, responsive, building topical research communities through collaboration, via both bottom-up and top-down funding strands.

The great success of the ERC in gathering top European academic talents shows that by providing the right approach and appropriate funding, backed by trust and respect in the granting process, great progress can be achieved in a relatively short timeframe. These lessons can be also applied to R&D at higher Technology Readiness Levels (TRL).

We, the FETAG, would like to draw the attention, especially of the European Parliament and the EC, to similar high impact research support instruments developed primarily in the ICT sector, that can fulfil this exciting and challenging role for the EU. It is the **'Future and Emerging Technologies'** (FET) program, which in our opinion can and should become the engine and the heart of EU-based research addressing the technological challenges and opportunities of the XXI century.

Since its inception, over 30 years ago, FET has been undeniably successful, and has established a well-deserved reputation for leading research strategy, through unique programmes like **FET-Open**, that will fund combinations of researchers from any discipline, and projects on any topic with the research continuum[1], through the larger and topic focused **FET-Proactive** instrument, to the ground-breaking **FET-Flagships**, the largest funded instrument under the Horizon 2020 programme, which is already influencing research thinking world-wide.

FET, therefore, has established a portfolio of solid and tested research instruments, a treasure in the EC research landscape, its scientific excellence evidenced by the high number of Nobel laureates involved in FET, and its socio-economic impact underscored by new technologies that have emerged from FET.

[1] „**From great science to thrilling technology**" Luxembourg: Publications Office of the European Union, 2017; http://ec.europa.eu/newsroom/dae/document.cfm?doc_id=47962

The FET approach and concept has at least two unique features:

1. Developing the "ideas value chain" by (i) testing an idea or technological concept on any topic or question, i.e., unconstrained, with a flexibility that allows for serendipity, and advancing it to a level of maturity from which it can be picked up by research organisations and industrial laboratories; (ii) identifying key technological challenges and building research communities from dispersed sources to tackle these ideas and, in the most promising cases, moving on to very large projects impacting both science and society.
2. The second is also two-fold: (i) the style of work with its free exchange of ideas adding value larger than the sum of the parts; (ii) building and consolidating research communities from a variety of actors through a wide spectrum of instruments in the framework programs.

In summary:

- FET has demonstrated that it supports science for competitiveness: emerging/disruptive technologies on the one hand, and themes with perceived greatest commercialisation potential and societal relevance, thus playing conceptually the role of the twin of the ERC.
- FET has worked and continues to work with other programs such as the ERA-NETs programmatically, and with COST thematically.
- Its instruments, which adapt dynamically to the needs of European economy and society, take the form of small, medium and large projects, spanning from 1 (**FET Launchpads**, one or more researchers) to 10 (FET-Flagships with around 1000 researchers) years, in a multiscale manner, each of them with a different role and modus operandi, which share the driving vector towards higher TRLs. This approach allows medium and large projects to adapt to new conditions during their lifetimes and maximise their impact. Thus, FET is not restrictive in terms of TRLs and spreads the risk associated with future technologies through the involvement of industry and co-funding approaches in Flagship projects.
- FET projects involve creative SMEs and Start-ups in a natural manner and establishes productive links between researchers and industry in a very practical way.
- Through simple rules that require at least three partners from at least two countries, FET very effectively enhances European cohesiveness and plays a vital role in removing national barriers and unleashing the true potential of our researchers.

This is why we, the FETAG, strongly believe that the FET program should not only be strengthened financially but should become the engine of the European Innovation Council, enabling the EIC to rapidly build its reputation based on a solid foundation provided by established instruments with proven success and popularity amongst European researchers[2].

[2] "**THE FUTURE OF FET: A possible nucleus for the European Innovation Council"**, FETAG, Sept 2015, https://ec.europa.eu/futurium/en/system/files/ged/the_future_of_fet.pdf